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EDITOR'S CORNER

A Snapshot of Arab Health: 2015

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The editorial team proudly presents the 2015 issue of the ***ACCESS Health Journal*** which chronicles the proceedings of the ***7th International Conference on Health Issues in Arab Communities***. During this conference which was held in Muscat, Oman in March of 2015, world experts presented cutting edge research, analysis, and reviews on several aspects of the prevailing health of Arab communities across the globe. The scope of the conference included public health, mental health, chronic diseases, cancer, infectious diseases, environmental diseases and others. The speakers and attendees came from a large number of countries across five continents, and included, physicians, nurses, scientists, health care workers, public health experts and concerned officials and citizens.

As you will observe while you review the ensuing articles and abstracts, this conference and its proceedings remain loyal to the original purpose of this recurring educational event: ***to continue to learn about and advance the health of Arab communities across the world***. This biennial conference was originally organized by health care providers linked

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to ACCESS in the great state of Michigan to collect data on the health of Arab Communities who had migrated from the homeland to the United States of America, Europe, Australia and other locations. The paucity of data was alarming and hindered efforts to design public health programs to benefit these communities. Through concerted efforts organized by the scientific and administrative teams at ACCESS, a large network of scholars of Arab descent as well as others with an interest in the health of Arab communities embarked on a campaign to identify available data, gaps in knowledge, and opportunities for research. These concerned healthcare providers pooled their data and produced an impressive array of findings that have guided health research and education as well as innovation in this aspect of the medical sciences over the past 15 years. This conference, its six precursors, and the network of individuals and institutions linked to this conference, have acted as catalysts for growth in the areas of public health, mental health, social determinants of health and chronic disease management.

It is noteworthy that this 7th conference had some unique features that will be apparent as you examine the ensuing manuscripts. We were fortunate to have an active partner in the Ministry of Health in the Sultanate of Oman which helped us take this conference to the next level and go beyond data collection and program design to the area of capacity building through collaboration and networking. This was the theme of this conference. We were delighted to have a large group of movers and shakers from Arab Communities in the Middle East and North Africa Region and from the countries of migration, work together with experts and concerned organizations across the globe to further the health of our communities. This conference established durable links among experts and institutions that will build capacity in health research, education and disease management.

As you examine these proceedings of this landmark conference, we encourage you to plan to become part of future conferences that will build on the successes of this one and reap the fruits of collaborative research in the various themes discussed during the varied sessions of this 4-day conference. Please use this opportunity to establish collaborative efforts with hundreds of world experts in the fields of public health, mental health, social determinants of health and chronic disease prevention and management, and lay the seeds for collaborative projects that would help our communities deal with chronic and emerging conditions. We look forward to seeing you at the next international conference.

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EDITORIAL

Empowering Communities and Individuals: Building Mental Health Capacity in the MENA Region

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The Middle East and North Arica Region (MENA) is going through a transformational process that will have consequences for decades. Massive displacements of populations, armed conflict, economic stresses, and political upheaval are but a few of the events confronting the region. The WHO estimated that there are approximately 32 million displaced people in the MENA Region now, all of whom have complex health needs. There is also a significant capacity challenge in that we do not have the resources or personnel to meet the need and demand for services. As we confront these large social and historical events, we must also confront the reality that there are not only resource and access barriers accessing healthcare, but also cultural barriers.

One area of particular concern is the lack of access to and a provision of mental healthcare and psychosocial capacity. In relation to the mental health consequences we are facing a public health crisis with upwards of 60% of displaced populations experiencing some psychiatric symptoms. My presentation described the challenges and some possible models for building capacity in delivering psycho-social services to displaced and besieged populations in the MENA Region.

In relation to the capacity challenge I proposed the development of a new innovative training program called, “Global Health Psychology”. The principles of global health psychology include:

1. Connecting, engaging and empowering individuals in communities to take an interest in promoting their own health and wellness
2. Working with locally naturally-occurring communities (schools, places of worship, etc).
3. Utilize both a bottom-up and top-down approach where East meets West and West meets East, by taking the best of cultural practices, rather than being exclusionary.
4. Providing services and intervention strategies that are both culturally and linguistically nuanced and respectful.
5. Global health psychologists can be viewed as health facilitators and enhancers, promoting the inherent resilience and capabilities of individuals and communities to take ownership over their further healthcare.
6. Utilizing the power of mobile tech to connect individuals and communities with healthcare information and interventions that can promote and improve wellness.
7. Harnessing the resilience and power of the human spirit towards wellness.

All of these principles guide us toward an understanding that global mental health is a fundamental human right that ultimately will benefit all communities. GHP Training Programs will train clinicians across many disciplines in these principles.

A new psycho-social intervention model was also described to meet the capacity crisis in the region. The Gaza Strip is one place where capacity challenges and severe traumatic exposure meet. Here we are developing an innovative program, the “Therapeutic Playground”, to help bridge the gap between capacity challenges and community need.

This concept brings together the notion of the traditional playground and the concept of therapeutic play, integrating them in a new model that will allow large numbers of children who have been exposed to traumatic events to come together as a community and reengage, reconnect and empower themselves to take steps towards healing and reintegration.

The program will encompass various types of play, including: attunement play, body play and movement, object play, social play, imaginative and pretend play, story-telling narrative play, and transformative-integrative and creative play. The program would also offer educational and support groups to the parents of these children to offer engagement for both children and parents, at the community level, with local mental-health care professionals.

Transforming static playgrounds into dynamic therapeutic spaces will allow traumatized children to engage in therapeutic play that better manages the symptoms of PTSD. Guided play helps local children learn more effective coping strategies and begin healing from PTSD. We will also provide psychoeducational training seminars on how to understand PTSD and manage symptoms for the parents of these children. This will be done in a culturally respectful manner and with the active engagement of the families and community. If successful, the playground will become a space for children, families, and the community to begin promoting psychological health and physical wellness.

EDITORIAL

Activities of Oman National AIDS Program (NAP) regarding the Prevention of HIV/AIDS and Health Promotion through Awareness Programs

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Introduction

There are an estimated 35 million people living with HIV (PLHIV) at the end of 2013 and 2.1 million more people each year are becoming infected. The HIV situation in Oman can be characterized as having a low-prevalence. Between 1984, when the first Omani HIV case was reported, and the end of 2013, a cumulative number of 2,394 Omani HIV cases have been reported. More than one-third of these individuals have died because of AIDS, whilst 1511 (63%) were still alive at the end of 2013.

One of the most powerful tools to reduce and prevent HIV transmission is HIV/AIDS education through health promotion and awareness activities. Spread the knowledge of HIV/AIDS lead to eliminate stigma and discrimination and normalized HIV/AIDS. Therefore, the expansion and improvement of HIV and AIDS education is essential in the community.

Objectives

- To reduce the HIV infection rate in the Omani community especially amongst adolescents
- To reduce death related to HIV/AIDS infection and promote healthy behaviors
- To reduce the stigma and discrimination around HIV/AIDS among health care workers and the general public

Types of HIV Prevention Strategies

- Awareness
    - Community
    - Key population
    - Health care workers
- HIV Testing and Counseling (HTC):
    - Voluntary and Counseling and Testing (VCT)

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VCT: an entry point and not the end point

Prevention of HIV transmission:

- From +ve tested mother to child
- From untested -unknown- partner/s to -ve tested people

Facilitates behavioral change

- Conducting personalized risk assessment
- Developing a personalized risk reduction plan
- Demonstrating appropriate condom use

Early Prevention & management of OIs and STIs

- Medical care
- Increase adherence to Preventive therapies

Normalizes HIV/AIDS & Reduce stigma

- Normalisation of HIV
- Reduction of stigma
- Promote awareness
- Support human rights

Reduces MTCT

- Un-booked delivery
- **Oman +ve example of PMTC**

Prophylaxis (Treatment as Prevention)

- Pre-Exposure Prophylaxis (PrPE): Can lower the risk of getting by taking one pill every. It is for people who do not have HIV but who are at substantial risk of contracting it.
- PMTCT: An HIV positive mother can gently lower the risk of transmitting HIV to her baby. Antiretroviral (ARV) drug during pregnancy, labor, and delivery; having a C-section; and avoiding breastfeeding. Oman is positive example of PMTCT
- Post- Exposure Prophylaxis (PPE): can prevent HIV after a possible exposure if started within 3 days.

Methods

Effective HIV/AIDS awareness programs include One-to-One counseling and interaction, awareness campaigns like Muscat Festivals and Salalah Festivals, lectures and workshops for health care workers and other, and Voluntary Counseling and Testing (VCT).

HIV/AIDS education can take place in many different settings and locations, from governmental and private sectors, to community. Through focusing on school, universities, sport clubs, Omani women associations and shopping malls. Using and distribution some educational materials such as HIV Questionnaire, leaflets, posters, banners, as well as concentrating on lectures and Workshops etc.

Staff and Volunteers

- Trained Qualified Counselors
- Youth-Peer (Y-Peer, UNFPA)

Results

HIV/AIDS awareness program of the NAP plays a vital role in:

- Reduction of new cases
- Reduction of misunderstanding and misinformation.
- Reducing stigma and discrimination.
- Seeking testing and treatment.

Discussion

HIV/AIDS awareness programs can help prevent new infections by providing people with basic information on HIV/AIDS. Focusing on the definition of HIV and AIDS, the different between them, mode of transmission of HIV, and how to protect themselves from becoming infected. This can have a major positive impact on HIV rates.

NAP and partnerships

National AIDS Program (NAP) has many partnerships in regard HIV/AIDS awareness programs, for example:

- Sister organizations; Sultan Qaboos University Hospital (SOUH), Diwan Hospital, Royal Oman Police Hospital, and Armed Forces Hospital (AFH).
- UN organizations e.g. UNFPA, and UNICEF and others
- Governmental sectors e.g. Ministry of education (Universities), Ministry of Health Ministry of Media, etc.
- Private sectors; companies, private health institutions

The Challenges

- Culture and community:
  Sensitivity of society towards Key populations e.g. Injecting Drug Users (IDUs), Men who have sex with Men (MSM), Commercial Sex Workers (CSW)
- Key population:
  Vehicle of transmission of infection

Conclusions

1. Extension and expansion the NAP awareness activities for example educates the prisoners about HIV/AIDS. In addition, involve other ministries such The Ministry of Justice, Awqaf and Islamic to involve AIDS topic in Friday Speech, and Ministry of Information to post new awareness programs using update technology, and Ministry of tourist to distribute educational material to the visitors especially during high tourist season such as Khareef Salalah.
2. National Strategic Plan (NSP)
   Involve other ministries such as The Ministry of Justice, Awqaf and Islamic Affairs to involve AIDS topic in Friday Prayer Speech, and Ministry of Information to post new awareness programs using update technology, and Ministry of tourist to distribute educational material to the visitors especially during high tourist season such as Khareef Salalah.
3. Reducing Stigma and Discrimination

EDITORIAL

The Return of Infectious Diseases in the Arab World and the Middle East: Public health needs

Rana A. Hajjeh

Infectious diseases continue to be a major public health problem in the Arab world and the Middle East region. A recent WHO/EMR report estimated that almost one third of all deaths in the Middle East is still due to infectious diseases; the most common infectious diseases causing deaths include respiratory infections, followed by diarrheal diseases, and childhood vaccine preventable diseases. In addition, the region recently witnessed the reemergence of various infectious diseases, including some that were thought to be almost eliminated, such as polio in Syria, and the emergence of novel infections such as the Middle East Respiratory Syndrome (MERS) in the Arabian peninsula. Multiple factors are responsible for the region continuing to be at high risk for infectious diseases and epidemics, including urban migration and rapid urbanization, political instability and wars, mass gatherings such as the Hajj, as well as inadequate health systems and public health infrastructure in many countries.

Infectious diseases of particular public health importance for the region include diseases of epidemic potential, healthcare-related infections and vaccine preventable diseases. The region continues to experience many large outbreaks: just in the last decade, there have been many waterborne outbreaks (cholera, typhoid), vector-borne outbreaks (dengue, Rift Valley fever) as well as avian influenza and meningococcal meningitis outbreaks. The re-emergence of viral hemorrhagic diseases such as dengue, RVF, Ebola, and yellow fever of special concern given the associated high morbidity and mortality and difficulty of control. Two epidemic diseases deserve special attention because of their chronicity and the associated cultural stigmas: tuberculosis, with struggling detection and treatment rates, and HIV/AIDS, with the region having the fastest rate of increase and the lowest rate of antiretroviral therapy coverage. The recent outbreaks of MERS in the Gulf countries due to a novel coronavirus has highlighted the continuous vulnerability even among countries with adequate resources, and the need for strong systems for surveillance and response as well as the need for adequate infection control capacity, which is critical in order to limit the spread of all healthcare-associated infections (HAIs). HAIs and antibiotic resistance (made worse by ramport and poorly regulated antibiotics use) are currently very serious problems, though underestimated due to lack of national data. For vaccine preventable diseases (VPDs), significant progress was made over the last 3 decades, with steadily increasing routine immunization coverage. However, the region continues to be a challenge to global polio eradication efforts, as it still has two of the world's three remaining pockets of polio (Pakistan and Afghanistan) and countries like Syria, that has been polio free for many years, experienced an outbreak in 2013-2014 due to the ongoing conflict and disruption of immunization services. Similarly, measles elimination efforts are jeopardized, and the region has experienced outbreaks of measles in particular among displaced populations. In addition, discrepancies still exist between various countries in the region when it comes to the introduction of the newer and life-saving but more expansive vaccines, such as those for pneumonia (conjugate pneumococcal vaccines), diarrhea (rotavirus vaccines) and cervical cancer (Human Papillomavirus vaccines-HPV- vaccines).

To overcome the challenges facing control and prevention of infectious diseases in the Middle East overall, strong public health systems are needed, including robust surveillance systems for early detection and response capacity, as well as an adequately trained workforce. Strong surveillance systems and laboratories are crucial to detect outbreaks early, but also to generate high quality data to guide interventions, whether vaccines or other, and to develop guidelines for both treatment and prevention of infectious diseases that are better customized to regional needs. Developing national and regional networks and registries that use standardized methodologies is one approach that will lead to better and more representative data. Building the human resource capacity by training more epidemiologists and public health laboratorians is a critical need, and is urgently needed to improve capacity of the region to better respond to various infectious diseases threats. Strengthening health systems overall, especially primary health care, can play an important role to improve prevention of infectious diseases in general.

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EDITORIAL

Executive Round Table

Hassan Fehmi

Introduction

The roundtable on Health Issues in Arab Communities was held Thursday March 5, 2015. Invited participants featured thought leaders from a host of academic institutions, research centers, and government agencies and non-profit organizations representing U.S., Omani, MENA, and UN affiliated entities. The roundtable was moderated by Dr. Hassan Fehmi, the Scientific Co-Chair of the 7th International Conference on Health Issues in Arab Communities, a full list of participants can be found below.

Background

Over the span of the last 10-15 years, the MENA region has been engulfed in geopolitical and socio-economic changes with major impacts on multiple fronts. The instability imparted by this lead to interruption in the academic and research endeavors underway, albeit timid in nature and scope, and resulted in many instances in a substantial deterioration in the quest for scientific advancement and learning. The need cannot be direr at this point and the goal of the roundtable was to start a dialogue to evaluate the landscape and review potential viable options.

The overarching themes addressed were: First, capacity building in research in the MENA region. Second, collaboration in research. And finally, research priorities.

Key Discussion Points

Assessing the landscape of academic research by those who actually operate in various academic and healthcare institutions in the MENA region was quick to reveal deficiencies on many levels. There was an acknowledgement of the scarcity of resources allocated for research (with very few exceptions in the GCC Countries), and a noted lack of institutionalized research (again with very few exceptions). It was noted that only one IRB is “serving” the region, and that lawmakers in various countries in the region need to be made aware of the value added by supporting the culture of research, funding research entities, and implementing their recommendations. Many recognized the difficulties faced by the region in general given political conflicts and instability and the lack of infrastructures for research. Many however viewed this as a “unique opportunity” to start with fresh perspective and lay the ground for what is actually needed and beneficial given the current environment. Capacity building in institutions as well as individuals was discussed. Participants recognized the lack of infrastructure or in some cases the frailty of existing ones, and felt that a major survey of the landscape is desirable as a prelude for subsequent meaningful next step(s). The need to develop and mentor those who actually work, locally, in this field was also noted.

Collaboration, both regionally and internationally, towards those goals was felt to be important and helpful to allow mutual learning, transfer of knowledge and sharing of success stories. Towards this end, participants agreed that local cooperation should look into various strategies to assess existing needs and capabilities, create regional research entities and councils and engage government agencies in order to influence policies and engender support. Garnering regional institutional and individual leadership, as well as identifying international bodies interested in capacity building in research in the MENA region would be a desired route to propel this agenda. NGOs may also be tapped for expertise in best practices for implementation and execution of collaborative research. Funding will be needed, both from regional and international institutions, this can be in the form of re-entry and/or connection grants to develop research personnel, programs and initiatives that are relevant and culturally tailored.

Many research priorities were discussed ranging from laying the ground by starting with a needs assessment to basic research in medical colleges to disease specific research focused around non-communicable chronic diseases known to be prevalent in the MENA region. The public health threats related to the current turmoil in the region was of great concern to the group. Participants felt that building on small successes will help to generate the needed momentum in the short term.

Recommendations

While all participants agreed that a network of researcher and research institutions will improve the prospect for capacity building in research by laying the foundation for serious and meaningful progress in this domain, the roundtable did not finalize its work by establishing such structure. Further discussion will need to follow to firm up the roundtable recommendations. The consensus of the roundtable can be summarized by the following points:

- Multidisciplinary collaborative approach is needed for any meaningful progress
- Start with a basic environmental scan of existing research capability in the region
- Establish an independent clearinghouse to identify who's who in research regionally
- Evaluate options to create a "Regional Research Council", and a regional IRB
- Plan to re-engage and involve additional stakeholders
- Identify and collaborate with US-based and international entities for stewardship, leadership and funding of research activity

Conclusion

In conclusion, the Roundtable confirmed the relevance and overwhelming need for capacity building in research targeted to the MENA region. The co-chairs of the 7th International Conference on Health Issues in Arab Communities confirmed their commitment to the creation of global working groups to further develop and explore concepts of selected themes of relevance, such as, data gathering and analysis, modalities for collaborative engagement and approaches to funding and ongoing support.

Looking forward, all participants were asked to consider their ability to commit to, participate in or lead the creation of Working Groups, based on ideas emerging from the Roundtable.

Cultural Barriers to Breast Cancer Screening Among Arab American Women

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Abstract

Introduction

Breast cancer is the second most common cancer among women worldwide (WHO, 2010) and in the US (CDC, 2013). A number of studies have suggested that cancer is diagnosed at later stages for Arab Americans and that prevention efforts should be better understood (Arshad, 2011; Hirko et al., 2013). Seventy percent of Arab American women greater than 40 years of age in the Detroit metropolitan area had received a mammogram compared to 92.6% among all women in Michigan (Schwartz, 2008). Psychosocial factors associated with breast cancer screening among Arab women include fear of the screening process, fear of negative results, embarrassment and stigmatization, language barriers, lack of knowledge, transportation and economic barriers, and cultural and religious barriers (Cohen & Azaiza, 2008).

Objectives

This preliminary paper is part of a larger study that is a cross country comparison of breast cancer screening barriers among Arab women in Israel and in the US. In this analysis we seek to better understand the cultural barriers that influence breast cancer screening among Arab women in metropolitan Detroit. The specific aims of this preliminary study were to examine the relationship of breast cancer screening barriers – 1) environmental; 2) social; 3) body exposure; and 4) religious -- to demographic characteristics such as age, education, years in US, employment, religion, religiosity, country of origin, and birthplace.

Methods

A heterogeneous sample of 196 women across different socioeconomic strata and Arab ancestry were recruited from a large health and social services agency and Mosques across the Detroit metropolitan area. Women who qualified to be in the study were approached by trained Community Health Workers who held meetings in their home or went to the home of the participant to administer a 15 minute paper and pencil questionnaire that included demographic characteristics, questions on breast cancer screening frequency and understanding, and an Arab Culture Specific Barriers to Breast Cancer Screening (ACSB) instrument (Cohen and Azaiza, 2008).

Results

A multiple regression analysis revealed significant relationships between the religious breast cancer screening barrier and less time in the US, identifying as Muslim, and being from Yemen. Age was significantly associated with the social and body exposure barriers with younger women indicating greater social and body exposure barriers to BC screening than older women.

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Conclusions and Implications

These findings point to a need to emphasize strategies that will target specific groups of Arab American women who have greater barriers based on religion and social factors. This study addresses breast cancer health disparities among Arab women in the US.

Introduction

Breast cancer is the second most common cancer among women worldwide (WHO, 2010) and in the US (CDC, 2013). Detecting breast cancer early is especially important to reducing morbidity and mortality (Armstrong, et al 2007). Breast cancer rates for Arab Americans are difficult to determine because Arab Americans are often categorized as White in racial designations and most datasets lack the specificity to identify Arab populations. There were about 1.5 million people of Arab ancestry living in the United States in 2010, representing a 76% increase since 1990. About one-third of all Arab household in the US are comprised of at least one person of Lebanese descent (Asi & Beaulieu, 2013) and the most concentrated area of Arab American settlement is located in southeastern Michigan, specifically in the city of Dearborn (Hatab Samhan, ND).

In 2005, 70% of Arab American women greater than 40 years of age in the Detroit metropolitan area had received a mammogram compared to 92.6% among all women in Michigan (Schwartz, 2008). Inflammatory breast cancer (IBC), a particularly aggressive form of breast cancer for which early treatment is critical, has been reported to be more common among Arab Americans compared to White non-Hispanic women (Hirko et al., 2013). A number of studies have suggested that cancer is diagnosed at later stages for Arab Americans and that prevention efforts should be better understood (Arshad, 2011; Hirko et al., 2013).

Mammogram screening rates are a proxy for adherence to the recommended guidelines of yearly mammograms for women 40 years and older. Recommended breast cancer screening (BCS) guidelines from the American Cancer Society for most adults are: 1) Yearly mammograms starting at age 40 and continuing for as long as a woman is in good health; 2) Clinical breast exam (CBE) about every 3 years for women in their 20s and 30s and every year for women 40 and over; and 3) Women should know how their breasts normally look and feel and report any breast change promptly to their health care provider. Breast self-exam (BSE) is an option for women starting in their 20s (ACS, 2014).

Psychosocial factors associated with breast cancer screening among Arab women include fear of the screening process, fear of negative results, embarrassment and stigmatization, language barriers, lack of knowledge, transportation and economic barriers, and cultural and religious barriers (Cohen & Azaiza, 2008). Women of Jordanian and Palestinian origin living in the US reported that cultural beliefs and the social stigma of having cancer reduced their participation in breast cancer screening (BCS) (Shah, 2008). Similar findings have been reported by investigators in different cultures (Arevian et al., 2011). Studies have found that culture-based interventions are successful at increasing knowledge and intention to receive BCS (Cohen & Azaiza, 2010; Williams, et al, 2013), as well as the rate of breast screening examinations among Arab women (Donnelly & Hwang, 2013).

This preliminary research is part of a larger cross country comparison of breast cancer screening barriers among Arab women in Israel and in the US. In this study we seek to better understand the cultural barriers that influence breast cancer screening among Arab women in metropolitan Detroit. The specific aims were to examine the relationship of breast cancer screening barriers – 1) environmental; 2) social; 3) body unease; and 4) religious -- to demographic characteristics such as age, education, marital status, number of children, years in US, employment, religion, religiosity, country of origin, and birthplace.

Methods and Subjects

A heterogeneous cross-sectional sample of women from different socioeconomic strata and Arab ancestry were recruited in June and July, 2014 from Mosques across metropolitan Detroit, and from the Arab Community Center for Economic and Social Service (ACCESS) that serves the largest Arab population in the United States. Women were invited to participate in the study if they had never been diagnosed with breast or ovarian cancer, were between the ages of 20 and 65, and had not participated in previous education/focus groups or studies related to breast cancer screening. Women who qualified to be in the study were approached by trained Community Health Workers and invited to attend meetings in the home of the Community Health Worker or the home of the participant where a 15 minute paper and pencil questionnaire was administered. Questionnaires were available in English and Arabic. Community health workers read the questionnaire for any respondent who needed assistance with understanding the content of a question or reading the questions. The questionnaire measured Arab women's barriers to breast cancer screening in 4 domains adapted from the Arab Culture-Specific Barriers (ACSB) instrument (Cohen and Azaiza, 2008). We also collected demographic characteristics such as age, education level, number of children, marital status, financial status, and questions on breast cancer screening frequency and understanding.

The final adapted ACSB to breast cancer screening scale used for this study had 17 items (Table 1) which measured breast cancer screening barriers in 4 domains: 1) environmental/contextual barriers (5 items); 2) social barriers (4 items); religious barriers (4 items); and body unease (4 items). Higher scores on the four domains indicate greater barriers to breast cancer screening. The study was approved by the Institutional Review Board of the academic institution of first author affiliation.

Statistical Analysis

We calculated the sum of respondent rankings of each ACSB domain and divided the sum by the number of items in the domain to derive a mean score. We used SPSS Statistics 22.0 for data analysis. All data were cleaned and double checked for accuracy. Descriptive analyses were conducted, followed by correlations and a multiple linear regression analysis on each of the four adapted ACSB domains to determine demographic predictors of Arab women's barriers to breast cancer screening.

Results

A total of 196 Arab women with a mean age of 38.6 years (range 20-65) were part of the study (Table 2). One-quarter (26%) did not have a high school diploma, although over half (55%) had some college, had complete college or had a graduate degree. Financial status was ranked as fair to good (Mean = 3.4 on 5 point scale). Two-thirds of the women were married (66%) and 41 percent were employed outside the home. The average number of children was 2.4 (range 0-10) and the number of years in the US was 19 years. The overwhelming majority of women were Muslim (91%) and over half (54%) identified their country of origin as Lebanon, while slightly less than one-quarter (22%) were from Yemen. Three- quarter (75%) of the women were born outside the US.

The mean scores for each of the breast cancer screening barrier domains were -- 2.1 ± 0.90 for environmental barriers, 2.2 ± 0.91 for body unease barriers, 2.1± 0.90 for social barriers, and 2.7± 0.80 for religious barriers -- on a 5-point scale with high scores reflecting greater barriers to breast cancer screening. These scores indicate a lower than average level of barriers in the domains of environment, social, and body unease, and moderate level of religious barriers. Table 1 shows the proportion of agreement to the individual items (barriers) that comprise each domain. The environment domain items that were most likely to be barriers for our sample of women were "language/communication difficulties" (20%) and "financial expense" (40%). In the body unease domain "not being able to recognize changes in breasts, because not sufficiently familiar with them" was identified as a barrier for almost one-third of the women (30%). The social domain barriers most influential were fear of being abandoned by husband (19%) and fear of losing job (23%). The items that were most likely to be barriers among the religion domain were "reading verses from the Qur'an can help cure cancer" (48%) and "believe, based on my religion, that cancer is a test from God" (41%).

Four multiple regression analyses (Table 3) were conducted for each breast cancer screening barrier domain. In the environment domain we found that as the number of children increased, the environment barriers to breast cancer screening increased. In the environment domain financial expense and language/communication difficulties were most frequently reported as barriers.

The multiple regression analysis for the social domain revealed a statistically significant relationship for social barriers and years of age. Younger Arab American women were significantly more likely to experience social barriers to breast cancer screening that revolve around fear of losing their job, husband, and/or friends if diagnosed with breast cancer. Arab women who were younger were also statistically significantly more likely to have body unease barriers. The most frequently identified area of discomfort revolved around Arab women lacking familiarity with their breasts in a way that allow them to identify changes. For the religious domain, fewer years in the US, being Muslim, and originating from Yemen predicted greater religious barriers to breast cancer screening.

Discussion

We found that overall Arab women in our study had lower than average barriers to breast cancer screening across three out of the four domains – environment, social, and body unease. However, in the multivariate analysis the importance of exploring the effect of age on perceived barriers to breast cancer screening was illuminated by the significant relationship between younger age and greater social and body unease barriers. This finding is consistent with other studies of Arab women that found that older women were more likely to practice breast self-exams than younger women (Elobaid, et al., 2014) or have had a provider referral for breast cancer screening (Salman, 2012). The age at which breast cancer is diagnosed in the Arab world was reported to be about 10 years earlier than in the western countries (Najjar & Easson, 2010). In our study we found that younger women had more body unease barriers, particularly around being familiar with their breasts in a way that would promote recognizing changes. This suggests that younger women of Arab descent would benefit from more education around the specific skills needed to monitor changes in their breasts.

Women experienced moderate barriers to BCS in the religious domain. In the multivariate regression, the characteristics of Arab women in our sample best predicted religious barriers (R2 =.30), compared to social, environmental, and body unease barriers. Our results show that the longer women lived in the US the lower their perceived religious barriers. This is supported by previous research that found level of Westernization strongly influenced breast cancer screening practices (Azaiza, et al., 2011). Arab American women who lived in the US over 10 years were more likely than those living fewer years in the US to intend to have a mammogram during the recommended timeframe (Schwartz et al., 2008). In a study of Muslim Arab women in the US researchers found that the longer the women lived in the United States, the more likely they were to receive a mammogram screening (Salman, 2012). Conversely, being Muslim and originating from Yemen statistically significantly increased religious barriers to BCS. Muslim Arab women's barrier to BCS stem from religious tradition and cultural attitudes therefore it is not surprising that being Muslim increased the religion barriers for BCS.

Over half of the Arab American women in our study originally came to the US from Lebanon. Previous research has shown that low BSE and mammography rates among women in Lebanon are influenced by fatalistic cultural beliefs (Arevian, Noureddine & Abboud 2011). While breast cancer prevention interventions that impart knowledge about breast cancer screening are extremely important for this population and have been found to be effective (Williams, et al., 2011), an understanding of the cultural barriers for subpopulations among Arab American women is warranted. Furthermore, the cultural attitudes and beliefs play a major part in Arab women's breast cancer prevention behaviors and these must be taken into account when developing interventions (Azaiza & Cohen, 2008; Shah, et al., 2008).

This study has a number of limitations that should be noted. The women in this study are a convenient sample and are not considered representative of all Arab American women. The inability to select a random sample of women from the Detroit metropolitan area may introduce selection bias. Furthermore, roughly 90 percent of women were Muslim, limiting the religious diversity that exists among the Arab American population.

Despite these limitations, the findings point to a need to emphasize strategies that will target specific groups of Arab American women who have greater barriers based on religion, body unease, and social factors. This study addresses breast cancer health disparities among Arab women in the US from a cultural perspective that acknowledges multiple cultural influences on breast cancer screening.

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Table 1: Adapted Arab Culture Specific Barriers (ACSB) to Breast Cancer Screening (N=196)

FACTORS	SA %	A %	N %	D %	SD %
Factor 1: Environment/Contextual Barriers					
Distance and difficulty in reaching the clinic	3	5	12	40	40
Language and communication difficulties	6	14	8	30	43
Religious ban on exposing the body	3	4	17	29	48
Fear of being seen at the clinic by acquaintances	1	9	12	32	45
Financial expense	16	24	11	24	25
Factor 2: Body Unease Barriers					
I feel uncomfortable looking at my body	6	9	15	38	32
I feel uncomfortable touching my breasts	3	8	16	38	34
I don’t have privacy to perform the exam.	4	4	11	40	41
I can’t recognize changes in my breasts, because I’m not sufficiently familiar with them.	8	22	22	29	19
Social Barriers					
I fear being abandoned by my husband	9	10	19	32	30
I fear losing my job	7	16	21	29	26
I fear that my children won’t respect me	3	3	10	40	44
I fear losing friend	4	7	8	43	38
Religious Barriers					
Reading verses from the Qur’an can help cure cancer	26	22	36	9	7
Taking cures given by traditional healers can cure cancer	5	13	35	27	20
I believe, based on my religion, that having cancer is in order to atone for sins	3	5	16	36	40
I believe, based on my religion, that cancer is a test from God	18	23	22	18	19

Table 2: Dependent and Independent Variables

Variables	*(Range)*	*N*	*Mean / %*	*SD*
Environment/Contextual Barriers a	(1-5)	193	2.1	.90
Body Unease Barriers a	(1-5)	194	2.2	.91
Social Barriers a	(1-5)	188	2.1	.90
Religious Barriers a	(1-5)	194	2.7	.80
Age	(20-65)	190	38.6	12.39
Number of Children	(0-10)	195	2.4	2.17
Number of Years in the US	(1-57)	177	18.9	10.14
Religiosity b	(1-4)	191	2.4	0.70
Financial Status c	(1-5)	195	3.4	0.70
Education				
Less than HS Diploma		46	26.0	
High School Diploma/GED		33	18.6	
College Degree/Some College		69	39.0	
Graduate Degree		29	16.4	
Marital Status				
Single		44	22.7	
Married		128	66.0	
Divorced/Separated/Widowed		22	11.3	
Employed Outside Home		79	41.1	
Religion				
Muslim		177	91.2	
Christian		13	6.7	
Druze/Other		4	2.0	
Country of Origin				
Lebanon		106	54.1	
Yemen		44	22.4	
Iraq		21	10.7	
Palestine/Jordan		13	6.7	
Other		12	6.1	
Birthplace				
US		49	25.0	
Outside US		147	75.0	

a Higher scores indicate greater barriers;
b Higher score indicates greater religiosity;
c Higher score indicates greater financial satisfaction

Table 4: Multiple Regression of Predictors of Barriers to Breast Cancer Screening Among Arab American Women (N=196)

	Environmental			Body Unease			Social			Religious		
VARIABLES	**B**	**SEB**	**β**	**B**	**SEB**	**β**	**B**	**SEB**	**β**	**B**	**SEB**	**β**
Age (20-65)	**-.017**	**.009**	**-.237**	**-.021**	**.008**	**-.330****	**-.018**	**.009**	**-.266***	**-.002**	**.008**	**-.030**
Education (ref. < HS)												
High School	.030	.227	.014	.173	.204	.090	.148	.218	.073	.096	.198	.046
College	-.149	.223	-.084	-.188	.201	-.118	-.008	.217	-.005	.028	.194	.016
Graduate Degree	-.267	.264	-.120	-.364	.238	-.184	-.162	.258	-.074	-.133	.232	-.061
Married	.169	.178	.091	.255	.160	.152	.131	.174	.073	-.144	.158	-.079
Number of Children (0-10)	.109	.049	.280*	.071	.045	.202	.047	.048	.126	.001	.043	.001
Employed	-.054	.180	-.031	-.149	.161	-.096	.126	.175	.076	-.079	.157	-.046
Financial Status	-.044	.107	-.037	-.001	.095	-.001	-.090	.103	-.080	.018	.092	.016
Number Years in US (1-57)	-.006	.009	-.076	.004	.008	.054	-.011	.008	-.134	-.022	.007	-.273**
Born in US	-.197	.218	-.099	-.018	.197	-.010	-.274	.212	-.145	-.003	.191	-.001
Religiosity	-.173	.115	-.141	-.070	.102	-.064	-.159	.111	-.136	.162	.098	.134
Muslim	-.143	.287	-.050	-.160	.259	-.062	.102	.284	.036	.675	.255	.231**
Country of Origin (ref. Lebanon)												
Yemin	.257	.186	.128	-.106	.167	-.058	.116	.180	.061	.487	.163	.246**
Iraq	.056	.286	.021	.038	.258	.015	-.247	.288	-.090	-.258	.253	-.094
Other	.041	.248	.016	.256	.217	.110	-.032	.240	-.013	.011	.206	.005

Note. **Religiosity**: 1=not religious; 2=traditional; 3=religious; 4=very religious **Financial Status**: 1=very bad; 2=bad; 3=fair; 4=good; 5=excellent * $p < .05$; ** $p < .01$

Cancer in a war-torn Arab community - Iraq: description of its trends [A review]

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KEYWORDS: *Cancer, Iraq*

Abstract

Introduction

It is well known that there are different trends of cancer behavior and incidence that are specific to certain communities and regions in the world. In Iraq, a war-torn Arab country, it seems that the cancer and its trends have a unique behavior and this became more obvious in the last decades. The aim of this review is to describe the behavior of cancer in different Iraqi regions and the behavior of the cancer in the whole country in comparison with different countries. It tries to answer one question: What are the trends of the cancer in Iraq?

Methodes And Materials

Descriptive review of the accessible data about cancer incidence in Iraq; in particular, the Iraqi Cancer Registry Results (1976 to 2010) by the Iraqi Ministry Of Health and the latest 2012 international GLOBOCAN registry by the International Agency for Research on Cancer.

Results

Ratio of cancer in the Iraqi males in comparison with the Iraqi females was 61.07% versus 38.93% in 1976 and became 46.23% versus 53.77% in 2010. Incidence range during the period 1991-2010 was (31.05 – 62.97/100,000 population). The rank of the leukemia and the neurological tumors showed obvious change in the period 1998 – 2010 and this recent trend (in 2010) was unique to Iraq if we compare it with three neighboring and three non-neighboring countries (Jordan, Kuwait, Iran, Japan, Germany and the United States of America). Incidence range in the Iraqi governorates in 2010 was (15.97 – 78.13/100,000 population) with an average rate of (56.89/100,000 population).

Conclusions

Trend of cancer in Iraqi community showed some interesting features if we compare this trend with that in other nations and in between Iraqis themselves. To reach sound conclusions about extent and determinants of cancer in Iraq, immense multi-spectrum, analytic efforts are needed. Attention should be paid by local and international authorities about the situation of cancer in Iraq, in order to better understand these trends and tailor the required control steps.

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Introduction

It is well known that there are different trends of cancer behavior and incidence that are specific to certain communities and regions in the world [1]. In Iraq, a war-torn Arab country, it seems that the cancer and its trends have a unique behavior and this became more obvious in the last years [2-4]. Cancer is the 3rd leading cause of deaths in Iraq after cardiovascular diseases and accidents and the seventh leading cause of morbidity [5].

The aim of this review is to describe the behavior of cancer in different Iraqi regions and the behavior of the cancer in the whole country in comparison with different countries. It tries to answer one question: What are the trends of the cancer in Iraq?

Methods and Materials

Descriptive review of the accessible data about cancer incidence and trends in Iraq; in particular, the Iraqi Cancer Registry (ICR) results published by the Iraqi Cancer Registry Center (ICRC) at the Iraqi Cancer Board (ICB) – Ministry Of Health (MOH) in Iraq, and the 2008, 2012 international GLOBOCAN registries developed by the International Agency for Research on Cancer (IARC).

Results

Results of the ICR was established in 1974 in Baghdad (launched firstly by the Iraqi Cancer Society and later on moved to the ICB at the MOH). ICR results provides a nation-wide registry of cancer cases and has been published in 17 editions (till February 2nd, 2015), either combined in consecutive years (1976-1985, 1986-1988, 1989-1991, 1992-1994, 1995-1997, 1998-1999) or separately on an annual basis (2000 - 2010) [6] [Figure 1 is showing the incidence rates in two decades, range 31.05 - 62.97/100,000 population]. ICRC is responsible for collecting information relating to every new cancer patient who is registered with governmental and non-governmental health institutions [hospitals & pathological laboratories] in all Iraqi provinces [Figure 2 & 3] [7].

The most recent ICR is the 17th edition in 2010. In that year, Iraqi population estimated to be of 32,489,972 and the reported cancer cases were 18,482. Incidence range in the Iraqi governorates in 2010 was 15.97 – 78.13/100,000 population, average was 56.89/100,000 population. No information at the 2010 ICR about the presenting stage at diagnosis or the mortality rate [8].

The top ten cancers in Iraqi males in 2010 were cancers of lung, urinary bladder, blood, central nervous system (CNS), colo-rectum, non-Hodgkin's lymphoma, prostate, skin, stomach and Hodgkin's lymphoma. The top ten cancers in Iraqi females were cancers of breast, blood, CNS, colo-rectum, non-Hodgkin's lymphoma, lung, ovary, thyroid, skin and urinary bladder. In all Iraqis (males and females), CNS tumors ranked eighth in 1998 [9], fourth in 2004 [10], then fifth in 2010 [8]; While leukemia ranked fifth in 1998 [9], second in 2004 [10], then third in 2010 8. Table 1 & 2 showing the top ten cancers in Iraq from the 2010 ICR [8] with the top ten cancers in three neighboring countries (Jordan, Kuwait and Iran) and three non-neighboring countries (Japan, Germany and USA) from the 2012 GLOBOCAN (age 15 and over) [11] for males and females in sequence.

The top ten cancers in children (0-14 year old) were leukemia, brain tumors, Non-Hodgkin's Lymphoma, Hodgkin's Lymphoma, kidney tumors, bone tumors, eye tumors, soft tissues tumors, ovarian tumors and adrenal gland tumors [8].

Cancer in the females were less frequent than males in Iraq in 1976 (38.93% versus 61.07%), then became in 1991 (45.37% versus 54.63%). With gradual increase, it became equivalent in 2000, and in the last couple of years, the cancers in the females have surpassed males in frequency (53.77% versus 46.23%) [8].

Discussion

The official reported incidence rate ranged from 31.1 to 62.97/100,000 population during the period 1991 to 2010. These rates have been highlighted as an increase in incidence by some of the investigators [12-17]. Some other investigators may argue in this regard and this can open the floor for further studies.

The rank of the leukemia and the neurological tumors showed obvious change in the period 1998 – 2010 and this recent trend (in 2010) was unique to Iraq if we compare it with three neighboring and three non-neighboring countries (Jordan, Kuwait, Iran, Japan, Germany and the United States of America). As an interpretation of these differences in the distribution of cancers between Iraq and other nations, some postulations can be put as causes to this variation, among which, might be, the relatively high tobacco use (in Iraqi males), high historical urinary bilharziasis (especially in the southern Iraq), low alcohol use (in Iraq), more environmental and uranium pollutants (that might have increased the incidence of hematologic and some solid tumors in Iraq), diet effect, body weight and life style effect beside other metabolic comorbidities (e.g. cardiovascular diseases) that may shorten life of the person in Iraq before the appearance of the slowly growing cancers (e.g. prostate cancer in males) [2].

For the rise in certain incidence rates of cancers in certain regions in Iraq (as obvious in Figure 2 and 3), Busby C et al mentioned about Fallujah city that (Little is known about the types of weapons deployed, but reports began to emerge after 2005 of a sudden increase in cancer and leukemia rates) [12] and Hagopian A et al mentioned about Basra city that (It is known that the Basra region was exposed to environmental insults including chemical weapons agents, pyrophoric depleted uranium, and the known leukemogen benzene, as well as ongoing undifferentiated water and air pollution) [17].

However, one can ask: Whether ICR incidence rate in Iraq is accurate or not? (In 2008, the ICR reported 14,180 new cases [18] while the GLOBOCAN estimated that there will be 19,900 new “cancers excluding non-melanoma skin cancer” in 2008 [19], i.e., 40% more)? The answer probably is not accurate, as the ICR is mainly of hospital/pathology–based data [15] and some cancer patients will be missed from the registry because they seek care outside the recognized oncology hospitals, or travel abroad. In addition, some cancer patients died before diagnosis, or are financially poor enough that they were not able to reach the oncology hospital in the city, being a neglected child by his/her parents in the village [20]. Some of them stay home without any active treatment altogether. All these postulations will reduce the accuracy of the ICR reported incidence of cancer in Iraq [Of note to mention here that Prof. Abdul-Hadi Al-Khalil “Vice Chairman of the ICB 1999-2005” mentioned in his report that the percentage of coverage of cancer reporting in Iraq is estimated to be between 70% - 80% [21].

Additionally, the GLOBOCAN mentioned in 2008 in regard to the data sources and methods about cancer incidence in Iraq [No national data available. The incidence rates of “all sites but skin” by sex and age were estimated as the mean of the estimates for Jordan, Iran, Saudi Arabia and Kuwait for 2008. They were partitioned by site according to: the frequency site distribution recorded in Baghdad (2004) and the frequency site distribution recorded in Basra (2005). These incidence rates were applied to the 2008 population] [19] and in 2012 [“All sites” age-specific incidence rates computed as the simple mean of the estimated rates for 2012 in Iran, Jordan, Kuwait, Saudi Arabia and Turkey were partitioned using data from Iraqi Cancer Registry (2005-2006) and applied to the 2012 population] [11].

There is no documented data from the ICR about the cancer stage at diagnosis. Nada Alwan reported in her study that only about 8% of breast cancer patients in Baghdad are diagnosed with stage I disease whereas 92% with stage II-IV “47% of them with stage III-IV” [22]. These numbers are nearly the same in the north of Iraq as reported by Runnak Majid (stage I breast cancer patients constitute about 4.1% whereas stage II-IV about 77.6% and there were 18.2% with unknown stage) 23. If we compare these numbers with other countries, we will find that some of the developing countries are similar to Iraq “or even worse” and some of them are better in early diagnosis, like Bahrain and Iran, where this group constitute about 33% and 25% respectively [24]. When we compare this group with a similar group in some of the developed countries like the United States for example, we will see that the situation is much better, where SEER reported that early breast cancer is diagnosed in 60% of the patients, regional stage in 33%, distant stage in 5% and there was 2% of unknown stage [25].

This is a descriptive, limited review and it is not an analytic, comprehensive review. Comparisons between the Iraqi cancer registry data with the international data may be inappropriate, because methods of data collection and the completeness of population denominators may vary widely. Wars and its consequences might be one of the reasons behind these interesting trends in this country and this community, but this needs further studies. There are scientific evidences that ionizing radiation can play a role in the development of certain cancers.

Conclusions

Trends of cancer in Iraqi community showed some interesting features if we compare these trends with that in other nations and in between the Iraqis themselves. To reach sound conclusions about extent and determinants of cancer in Iraq, immense multi-spectrum, analytic efforts are needed. Attention should be paid by local and international authorities about the situation of cancer in Iraq, in order to better understand these trends and to tailor the required control steps accordingly.

Figure 1: Incidence rate of Cancer in Iraq in two decades (1991 -2010) (2010 ICR)

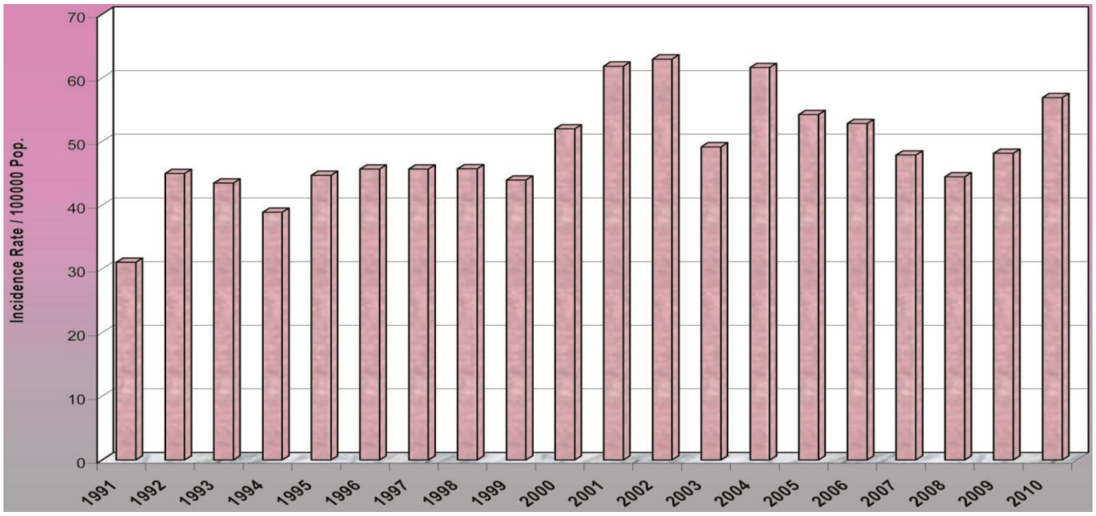

Figure 2: The Incidence Rate of Cancers Cases in Iraqi Provinces (2010 ICR)

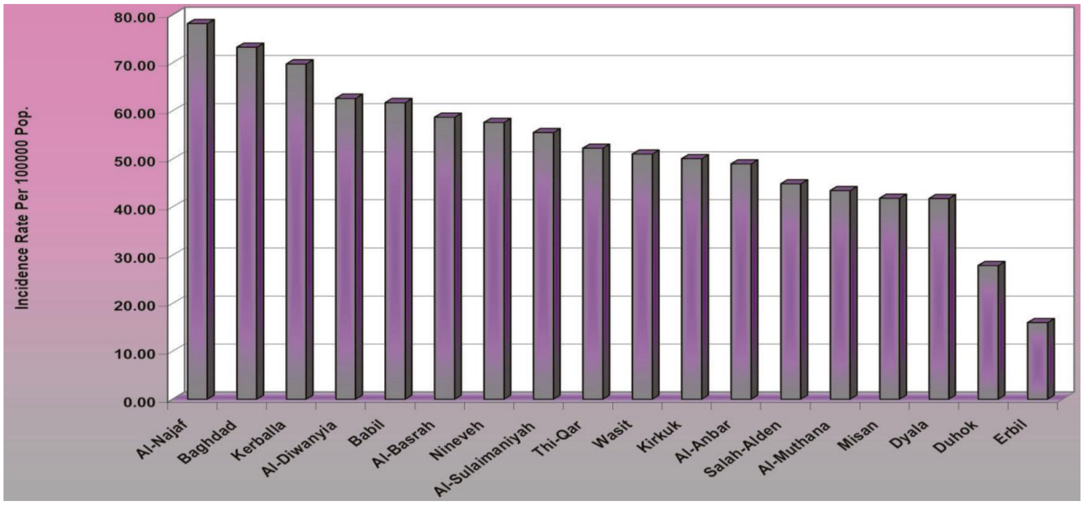

Figure 3: Incidence rate of Leukemia in Iraqi provinces in 2010 (2010 ICR)

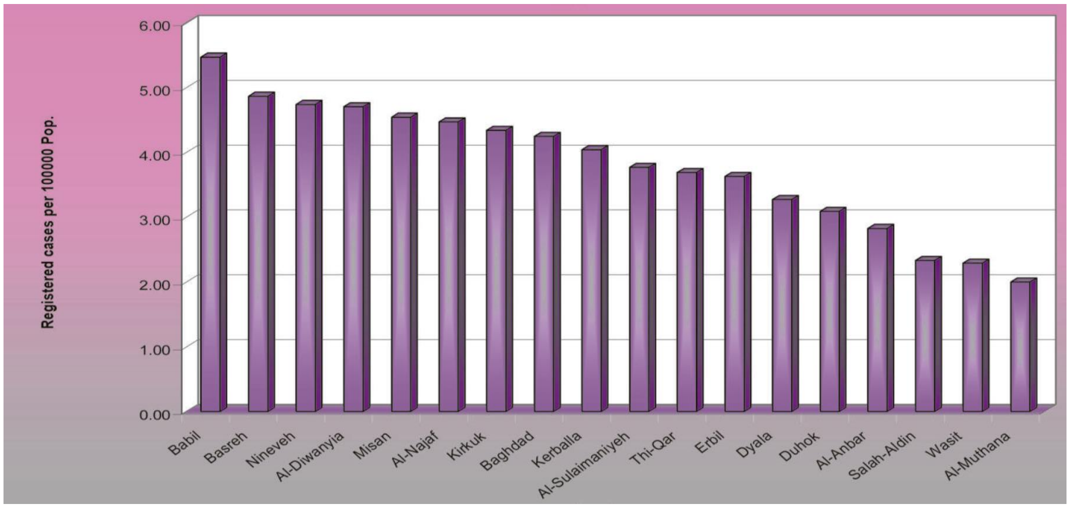

Table 1: Top ten cancer in Iraqi males (2010 ICR) compared to the top ten in six countries (2012 GLOBOCAN)

Iraq	Jordan	Kuwait	Iran	USA	Germany	Japan
Lung	Colorectum	Colorectum	Stomach	Prostate	Prostate	Stomach
Bladder	Lung	Prostate	Bladder	Lung	Colorectum	Lung
Leukemia	Prostate	Lung	Prostate	Colorectum	Lung	Colorectum
CNS	Bladder	NHL	Colorectum	Bladder	Bladder	Prostate
Colorectum	**Leukaemia**	Bladder	Lung	Skin Melanoma	Kidney	Liver
NHL	Stomach	**Leukaemia**	Oesophagus	Kidney	Stomach	Pancreas
Prostate	NHL	Liver	**Leukaemia**	NHL	Skin Melanoma	Bladder
Skin	Larynx	Pancreas	NHL	Liver	Pancreas	Oesophagus
Stomach	Liver	Stomach	**CNS**	Pancreas	NHL	Kidney
HL	Pancreas	HL	Larynx	**Leukaemia**	Liver	NHL

Abbreviation: Central Nervous system (CNS), Non-Hodgkin's Lymphoma (NHL), Hodgkin's Lymphoma (HL).

Table 2: Top ten cancer in Iraqi females (2010 ICR) compared to the top ten in six countries (2012 GLOBOCAN)

Iraq	Jordan	Kuwait	Iran	USA	Germany	Japan
Breast	Breast	Breast	Breast	Breast	Breast	Breast
Leukemia	Colorectum	Colorectum	Colorectum	Lung	Colorectum	Colorectum
CNS	Thyroid	Thyroid	Stomach	Colorectum	Lung	Stomach
Colorectum	NHL	Corpus uteri	Oesophagus	Corpus uteri	Corpus uteri	Lung
NHL	Ovary	Cervix uteri	Ovary	Thyroid	Pancreas	Pancreas
Lung	Stomach	Ovary	Lung	Skin Melanoma	Skin Melanoma	Liver
Ovary	Corpus uteri	**Leukaemia**	Thyroid	NHL	Kidney	Corpus uteri
Thyroid	**Leukaemia**	Lung	**Leukaemia**	Kidney	NHL	Gallbladder
Skin	Lung	NHL	**CNS**	Pancreas	Bladder	NHL
Bladder	**CNS**	Bladder	NHL	Ovary	Ovary	Cervix uteri

Abbreviation: Central Nervous system (CNS), Non-Hodgkin's Lymphoma (NHL), Hodgkin's Lymphoma (HL).

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Education modifies the association of wealth with obesity in women in middle-income but not low-income countries: an interaction study using seven national datasets, 2005-2010

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Abstract

Background

There is strong evidence of a growing burden of obesity in low- and middle-income countries (LMICs). Education and wealth may have different associations with female obesity but this has not been investigated in detail outside high-income countries. This study uses a representative sample of LMICs to examine the separate and inter-related associations of education and household wealth with female obesity.

Methods

Nationally representative data of women aged 15-49 years collected in the period 2005-2010 from seven countries with different levels of economic development. The datasets were identified from a list of Demographic and Health Surveys (DHS) ordered by sample size. Separate and joint effects are calculated using a multivariate logistic regression model and adjusted for age group, parity, and urban/rural residence.

Results

There was a statistically significant difference between the average interaction estimates for the low-income and middle-income countries (P<0.001). An interaction was found between education and wealth on obesity (P-value for interaction <0.001) in the four middle-income countries (Colombia, Peru, Jordan, and Egypt: among women with no/primary education the wealth effect was positive whereas in the group with higher education it was either absent or inverted (negative). In contrast, there was no evidence of an interaction in the poorer countries (India, Nigeria, Benin): the associations between each of education and wealth with obesity were independent and positive.

Conclusions

The findings suggest that, as countries develop, education may protect against the obesogenic effects of increased household wealth. Further research could investigate country differences in the role of education.

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Introduction

Non-communicable diseases (NCD) are the major cause of morbidity and mortality in most countries worldwide, representing more than 60% of total annual deaths.[1] Currently, almost 75% of NCD deaths occur in low- and middle-income countries (LMICs), indicating that NCDs are not diseases confined to high-income countries. [2] Obesity is a major risk factor for NCDs particularly heart disease, cancer and diabetes for which obesity is a key risk factor [3].

Obesity has reached particularly alarming levels in the Middle East and North Africa (MENA) region [1]. For example, by the 1990s, Egypt's prevalence of female obesity (currently estimated at over 40% [4]) had already exceeded that in Europe and the USA [5]. A recent review reported that the prevalence of overweight and obesity among adults in the MENA region ranged from 50 to 80 %, with higher prevalence among women than men.[1]

Country comparisons have played a central role in understanding the association between socio-economic status (SES) and obesity in relation to country levels of economic development [6,7,8,9]. Most of this research suggests that obesity is a problem of the elites in poorer countries including the Arab world, with a process of gradual reversal occurring as countries develop and food becomes more available, so that it eventually becomes a problem of the poor in high-income countries. However, the social distribution appears to vary depending on the indicator of socioeconomic status and this could be explained by examining the indicators separately.

In LMICs, rising income or wealth may be used to purchase greater quantities of food which increases obesity risk [10]. On the other hand, education may mitigate this effect through cognitive skills that influence information processing and health-related decision-making [11,12]. In other words, individuals may be able to modify their response to an increasingly obesogenic environment by drawing on personal resources such as educational capital and cognitive skills to navigate new disease risks. This may be useful where interventions targeting the food industry are politically unfeasible.

Objective

This study seeks to build on the findings from a previous study on Egypt[13] suggesting that education protects against the obesogenic effects of wealth in women. It examines whether the findings from Egypt are replicable in middle-income countries, including other MENA countries, and whether they are confined to middle-income countries or extend to low-income countries. Therefore, the study tests the hypothesis that education may protect against the association of wealth with obesity in middle-income countries. It aims to open up new avenues of investigation for the dynamic nature of the social distribution of obesity in emerging economies and document previously unreported patterns of association.

Methods

Dataset

The Demographic and Health Surveys (available: DHS - http://www.measuredhs.com/Data/. Accessed 2013 Jan 1) are a key source of data for studies on obesity [5,7,8,9,14,15,16,17]. They are nationally representative household-based, cross-sectional surveys using a multistage stratified probabilistic sampling design, using standardised methodology and survey instruments. The primary population surveyed is the universe of all ever-married women aged 15-49 years [18].

Study sample

All countries for which a DHS survey had been conducted between 2005 and 2010 (the latest wave at the time of this study) were eligible. They were listed according to sample size using the DHS STAT compiler tool available on the DHS website (available: http://www.statcompiler.com.). We selected the six countries with the largest datasets for comparison with the Egyptian DHS dataset used in a previous study [13]. They included Benin, India, Nigeria, Peru, Jordan and Colombia and represented a range of country income levels based on the World Bank country income classification at the time of the survey (available: http://data.worldbank.org/about/country-classifications> and notes http://tinyurl.com/cnhf9aw).

In order to include another country from the Middle East and North Africa (MENA) region to provide a closer comparison with Egypt culturally, Jordan was also selected. Table 1 shows the survey characteristics by country including response rates which were all above 90%. Pregnant women were excluded (see Table 1), but not extreme values as there were too few to influence the estimates and variance.

Outcome and covariates

Body mass index (BMI in kg/m^2) was calculated as (weight/height^2) and the cut off for obesity was defined as a BMI≥30kg/m^2. Participants were weighed on a digital scale and their weight recorded in kilograms to the nearest 100 grams. Height was measured using an anthropometer with standard gradations and recorded to the nearest millimetre.

Education level was based on self-reported educational attainment recorded by the interviewers. It was coded into two categories (1=no/primary education, 2= secondary/higher education) for the main part of the analysis to ensure sufficient numbers in the subgroups. A second analysis was conducted with a three-level education variable (1=no/primary education, 2= secondary, 3=higher) in the middle-income countries to add further differentiation to the education variable and examine dose-response.

The wealth index was generated for each country separately and places individuals in relative position to each other on a locally appropriate continuous scale of economic status [19]. It was originally developed to measure the ability to pay for health services but is also used as a general indicator of material circumstances [20]. Data on the ownership of durable assets such as electrical equipment (e.g. TV, computer), basic amenities (e.g. sanitation, water supply) and housing characteristics (e.g. floor material) are used to generate a wealth index score through principal components analysis based on the Filmer & Pritchett method [19]. This is a data reduction technique where the correlations between the full set of asset variables are used to generate a number of uncorrelated principal components. Only the first principal component - the one that explains most of the variance of the indicator variables - is selected to derive a score for each household. It was divided into quintiles (1=poorest; 5=richest) for each country.

Age group in ten year bands and parity (number of children) were included as biological confounders [21], and urban/rural residence as a simple adjustment for environmental exposures. Parity was used as a categorical variable with four groups (0; 1-3; 4-6; 7+). Parity is thought to be an important factor related to obesity in high income countries [22] and low-and-middle income countries (LMICs)[21]. Women with a greater number of children are more susceptible to excess weight due to a number of factors including physiological and psychological factors. LMICs have much higher fertility rates than HICs as well as greater variation in the number of children between women of different social groups and, therefore, parity is likely to have even greater importance as a biological confounder [21].

Statistical analysis

Each country was analysed separately. Stata 12 SE® complex survey procedures were used with the survey weights provided with each dataset to account for the design effect and obtain nationally representative prevalence estimates. To test the hypothesis that education level modified the association between wealth and obesity, an interaction between education and wealth was fitted in the logistic regression models. Education was used as a categorical variable. We tested whether the effect of wealth across the quintiles could be adequately described using a single linear term by comparing models with wealth fitted as a categorical or linear term. This showed that the associations between wealth and obesity were adequately described using wealth as a linear term. In addition, to check this linearity assumption visually, we plotted the associations, using the log odds ratios, between wealth, education and obesity using wealth as a categorical variable.

In order to assess for multi-collinearity between the independent variables in the model, variance inflation factors were calculated [23]. The averages of the interaction estimates for the low- and middle-income countries were compared using formal statistical testing.

Four models are presented. The first two models provide estimates for the association between each of education and wealth with obesity separately. The estimates are presented both unadjusted and adjusted for age group, urban/rural residence and parity). The third model includes both education and wealth. The fourth model includes education, wealth and an interaction between education and wealth. The effect of wealth (the effect of an increase in one wealth quintile on the odds of obesity) in the no/primary education group is estimated from this model. Then, using the interaction estimate for education-by-wealth, we calculated the effect of wealth within the higher education groups. Likelihood ratio tests comparing the goodness of fit between the third and fourth models allowed the interaction effect between education and wealth to be tested.

Results

Table 1 shows details of the seven countries. Benin, India, Nigeria were low-income (LI) countries, while Egypt, Colombia, Jordan, Peru were middle-income (MI).

Socio-demographic characteristics

Table 2 shows that the middle-income countries had higher levels of education and more urban populations. The obesity prevalence was strikingly high in Egypt and Jordan (43.6% and 30.5% respectively) and was more than double that of Peru and Colombia (14.1% and 14.3% respectively) which are richer countries.

Obesity prevalence

Table 3 shows that the prevalence of obesity was higher in the wealthier and older women, and tended to be higher in women with a greater number of children. It increased with education in the poorer countries but decreased with education in the richer countries. The absolute difference in prevalence between the richest and the poorest wealth groups diminished with increasing education level in the middle-income countries.

Separate, independent and interaction effects of education and wealth by level of economic development

The variance inflation factors for the independent variables used in the model were less than three in all countries indicating that multi-collinearity was not a concern for the analysis. The wealth by education interaction estimates from the logistic regression models were heterogeneous across all seven countries and, in particular, the difference in the average of the interaction estimates in the low-income countries compared with the middle-income countries had a *P*-value of <0.001, thus, providing strong evidence of a difference between these two groups which are described separately in Tables 4 and 5 respectively.

i) Low-income countries (Benin, India, and Nigeria)

The top part of Table 4 shows a positive association between each of education and wealth before and after adjustment. In India (the largest sample), the unadjusted odds of obesity are 2.06 times higher (95%CI: 1.92, 2.21) for the secondary/higher education group vs. the group with no/primary education; and 2.23 times higher (95%CI: 2.07, 2.41) after adjustment. In terms of wealth, the odds of being obese increased by 2.77 times for each increase of one wealth quintile (95%CI: 2.65, 2.89) and remained positive after adjustment (OR; 95%CI: 2.41; 2.30, 2.53). A similar pattern was observed in Nigeria and Benin.

The middle part of Table 4 shows the independent effects of education and wealth from a model that includes both of these variables. The effect of education was much smaller in magnitude compared with the first part of the table, but the effect of wealth was little affected. This suggests that wealth may largely account for the apparent positive association between education and obesity observed in the low-income countries.

The bottom part of Table 4 illustrates the absence of evidence of an interaction (P>0.05), although the *P*-value for India (*P* =0.06) was relatively closer to statistical significance than Benin or Nigeria (*P*=0.2 and 0.8 respectively).

i) Middle-income countries (Egypt, Colombia, Jordan, and Peru)

In contrast to the low-income countries, the associations shown in Table 5 between education and obesity in the middle-income countries tended to be negative (OR<1) both before and after adjustment. In Colombia (the largest sample), the adjusted OR for the secondary/higher education group compared with the group with no/primary education was 0.79 (95%CI: 0.74-0.84). There was an inverse wealth-obesity association (adjusted OR; 95%CI: 0.94; 0.91, 0.96).

The middle part of Table 5 shows the independent effects of education and wealth in a model that includes both with the control variables. In contrast to the low-income countries, the association between education and obesity was inverse (<1). In Colombia, the association between wealth and obesity was negative (adjusted OR; 95%CI: 0.96; 0.93, 0.98).

The results for the regression model including the interaction between education and wealth are shown in the lower part of Table 5 as well as Figure 1. The comparison of models with wealth fitted as a categorical or linear term showed that the associations between wealth and obesity were adequately described as a linear term. Figure 1 illustrates these interactions using the log of the adjusted odds ratios and plots the associations between wealth, education and obesity using wealth as a categorical variable. The plots supported the use of wealth as a linear term. There was very strong evidence of an interaction for all countries ($P<0.001$). In the lowest education group, there was a positive wealth effect in all four countries. However, in Colombia and Jordan, the wealth effect was negative in the secondary/higher education group (OR; 95%CI: 0.92; 0.89, 0.94 and 0.91; 0.86, 0.96 respectively), while in Egypt and Peru the wealth effect in this group was non-significant. Of note, in both Jordan and Colombia - the countries with the strongest interaction effect - there is a negative association between wealth and obesity in the model with wealth alone and when wealth and education are mutually adjusted for (see Tables 5 and 6) rather than a positive association. For the countries where we were able to split education into three levels, as shown in Table 6, the results show that the positive wealth effect diminished progressively with higher levels of education.

Discussion

The objective of this study was to build on a study on Egypt to further investigate the SES-obesity association in LMICs using two indicators of SES and to test the hypothesis that education may modify the association between wealth and obesity in middle- but not low-income countries. The findings show that while wealth tended to increase the odds of obesity in all countries, education appeared to have a protective role against the wealth effect in the middle-income countries (Egypt, Jordan, Peru and Colombia) only. Another finding was that the highest obesity rates were not in the richest countries.

Comparison with prior studies

Literature reviews of the SES-obesity association have reported different associations by SES indicator including education and wealth [9,24] and a number of single country studies from LMICs have reported separate effects of education and indicators of income or wealth including Peru, the Philippines, China and Brazil [25,26,27,28]. No empirical studies have focused on investigating the relationship between different indicators or how these associations diverge by level of economic development for different indicators, although in a previous study, we have demonstrated an interaction between education and occupation in older Chinese women [29].

The findings in this study corroborate the existence of a changing SES-obesity association dependent on a country's level of economic development including in Egypt and Jordan as representative MENA countries [6,7,8,9]. However, two studies claim that DHS data do not provide any evidence of an SES-overweight/obesity reversal [16,17]. This may be due to the use of a different outcome (overweight rather than obesity) or the use of fewer middle-income countries compared with a similar study supporting the reversal [30]. Notably, the authors place little emphasis on the education variable in their interpretation of the findings and focus on the wealth indicator which could mask the complexity of the social transition experienced in LMICs. Our findings concur with others emphasising that the social gradient of obesity is positive (high SES-high obesity) in India specifically [31], but also support the more general notion that obesity is a growing problem among those with lower education in LMICs. We propose a reinterpretation of the apparently contradictory studies [16,17] and suggest that the education-obesity association may reverse before the wealth-obesity association.

Explanations

There is a generally positive correlation between level of economic development and obesity levels with key correlates being urbanisation, calorie abundance, and women's participation in the labour market [32]. However, urbanisation appears to be less important than previously thought and a rapid rise in obesity levels among rural populations has been reported in middle-income countries recently [33,34]. This is reflected in the differences in obesity prevalence by urban and rural residence in this study: the obesity prevalence is higher in both urban and rural areas in middle-income countries compared with low-income countries and the relative difference between the two areas is smaller. Data from China show that the prevalence of obesity has increased at a faster rate in the poorer rural areas than in the richer urban ones [35] and that lower income groups have disproportionately increased their consumption of animal fat and edible oil and reduced their consumption of healthier traditional foods [36].

One explanation is the increasingly widespread availability of processed, high-calorie food and drinks with such extensive supply chains that they are used for the delivery of antiretrovirals in countries where public health infrastructure is inadequate [37]. Aggressive marketing and strategic pricing in emerging economies are an important source of revenue for transnational corporations whose profits margins are decreasing in the West [38,39], and new consumers may require greater cognitive resources to navigate these sophisticated economic signals. Therefore, as populations are increasingly exposed to processed, energy-dense foods, we can expect a general rise in obesity across all socioeconomic groups in middle-income countries, but especially among lower educated urban women. The high levels of obesity in the MENA countries could be partly explained by the energy subsidies of food and fuel that are widespread in the region and encourage the consumption of energy-dense foods as well as the use of motorised transport. [40]

The combination of persistent food insecurity in certain geographical areas (rural) and increased calorie availability overall may exacerbate the effects of the nutrition transition. In environments with longstanding food insecurity, metabolic programming and cultural memes transmitted between generations may favour the accumulation of calories [41], thus explaining the positive association between wealth and obesity. A rapid integration within the global economy resulting in a sudden influx of high-calorie products may alleviate the drive for calories before public health systems or health knowledge related to non-communicable diseases have taken root. This may result in a large information asymmetry between buyers and sellers [42]. Within this environment, having a higher level of education may provide an advantage through cognitive skills that can make up for the information asymmetry. Knowledge acquisition and information processing skills may assist in correcting cognitive biases created through marketing, thus resulting in clearer risk perception. In other words, education may extend capability, defined as a freedom that expands the range of options a person has in deciding what kind of life to lead, as well as developing judgment in relation to the appropriate exercise of choice [43].

There are a number of other possible pathways for the role of education which have been extensively discussed elsewhere [44,45]. These include social norms and values since educated women may favour Western norms of thinness as a beauty criterion and use it as a means of social distinction [46]. These norms may be spread or reinforced within the educated elites through social network effects including through educated occupational classes which we could not control for in our analysis [47]. Educated women may come from different family backgrounds and their own mothers may have benefited from better education or food security thus reducing the risk of a metabolic mismatch between early and later life [48]. Finally, there is a link between marital status and obesity in high-income countries and educated women may be more likely to be unmarried. However, marital status did not explain the SES-obesity association in women in other LMICs [49].

Strengths and limitations

The DHS datasets benefit from a highly standardised survey methodology and the results were remarkably consistent within country income groups. The cross-sectional nature of the data limits temporal and causal inferences, although this investigation did not seek to provide a causal analysis but to examine differences in patterns of association by level of economic development. Further research could investigate causal explanations for the country differences and/or possible pathways of explanation for the inverse education-obesity pathways in middle-income countries i.e. why are there opposite associations between education and wealth/income and obesity? Education may measure different things in different countries and women's occupation, marital status, body shape preference and husband's SES may have a greater or lesser importance depending on the country context.

It is also possible that reverse causality and health selection may be operating and that obesity determines educational and wealth opportunities. The pathways in this sample of countries are likely to be complex and vary from country to country. In Colombia, it is possible that being thin confers a social advantage while being obese is stigmatised, while the opposite might be the case in a low-income country like Benin. These cultural preferences are likely to vary by region (urban/rural) and by social group so that a more detailed country analysis and longitudinal data would be required to disentangle the direction of causality. However, this study aimed to engage with the current literature on the reversal of the SES-obesity gradient in women and makes a step forward in elucidating the complex social epidemiology of obesity in transition settings.

Finally, women under 17 years will not have had the opportunity to enter university and achieve the highest level of education, thus leading to the possibility of misclassification of education level. However, the number of women in this group was relatively small and is unlikely to change the patterns observed in these relatively large country samples.

Conclusion

This study sought to investigate the separate the effects of women's education and wealth in relation to obesity, building on previous research findings from Egypt. The results support other studies documenting different SES-obesity associations by indicator and that the SES-obesity gradient reverses by level of economic development. The findings also support the hypothesis that in middle-income countries education may protect against the obesogenic effects of wealth and that this phenomenon is dependent on level of economic development rather than regional or cultural factors specific to the Arab world.

These findings are particularly pertinent to countries where a rapid integration within the global food market may be occurring. In such settings, the combination of a longstanding metabolic and psychological drive for calorie accumulation combined with a sudden influx of heavily marketed high-calorie products, while public health systems are ill-equipped to deal with an emerging non-communicable disease burden, might exacerbate the asymmetry of information between sellers and buyers. In the Middle East, energy subsidies may complicate matters further by providing easy access to calories. A strengthening of global and national governance systems overseeing markets and public health infrastructure alongside promoting access to formal education for women and considering energy subsidy reform may be crucial to addressing the obesity epidemic in the Arab world [50]. From this perspective, investment in women's education may be viewed as a public health intervention to address obesity and related diseases benefiting from synergies with multiple other development agendas.

Conflicts of interest

None.

Figure 1 Interaction between education and wealth on the odds of obesity in women in middle-income countries.

Each point represents the log OR of that combination of education level and wealth quintile compared with the reference category (education level=none/primary and wealth quintile=poorest). Error bars represent the standard error of the log OR. All plotted estimates are adjusted for age group urban/rural residence and parity.

Table 1 Sample details by economic classification at the time of the DHS survey for each country included in the analysis.

	Benin	India	Nigeria	Egypt	Jordan	Peru	Colombia
GNIpc at time of survey ($)[1]	590	720	1170	1250/1880	3110	3590	5510
Income classification[2]	LI	LI	LI	MI	MI	MI	MI
DHS Year	2006	2005	2008	2005/08	2007	2008	2010
Number of women interviewed	17794	124385	33558	36045	10876	16159	53320[3]
Response rate of women eligible for interview	94	95	97	>99	98	98	94[3]
Women with complete anthropometry	16717	118734	32358	35690	5196[4]	15228	49637
Missing covariates (% of anthropometry sample)	0	<0.01%	0	0	0	0	7.6%
Final analytic sample [5](figures below relate to this sample)	14883	113063	28901	32272	4527	14483	47709

1 GNIpc in $ using Atlas method at time of survey, World Bank classification. <http://tinyurl.com/3bpg77q >

2 World Bank income classification. <http://data.worldbank.org/about/country-classifications> and notes http://tinyurl.com/cnhf9aw>. LI=low-income; MI=middle-income.

3 Includes women 13-49 years (the rest of the figures for Colombia are for women 15-49 years)

4 Anthropometry collected in half of the household sample

5 Excludes pregnant women; includes missing covariates

Table 2 Participant sociodemographic characteristic in each country, DHS data.

	Benin 14883		India 113063		Nigeria 28901		Egypt 32272		Jordan 4527		Peru 14483		Colombia 47709	
	Total N	**% (SE[1])**	**Total N**	**% (SE[1])**	**Total N**	**% (SE[1])**	**Total N**	**% (SE[1])**	**Total N**	**% (SE[1])**	**Total N**	**% (SE[1])**	**Total N**	**% (SE[1])**
Income bracket	LI		LI		LI		MI		MI		MI		MI	
BMI (kg/m^2)														
Non-obese	14090	94.3 (0.3)	109075	97.2 (0.1)	27349	94.0 (0.3)	19146	57.0 (0.6)	2992	69.5 (1.2)	12307	85.7 (0.5)	40573	85.9 (0.2)
Obese BMI	793	5.7 (0.3)	3988	2.8 (0.1)	1552	6.0 (0.3)	13126	43.0 (0.6)	1535	30.5 (1.2)	2176	14.3 (0.5)	7136	14.1 (0.2)
Education														
None/primary	12463	82.9 (0.8)	52274	55.2 (0.6)	16810	54.2 (1.3)	16250	49.1 (0.7)	793	12.7 (0.9)	4462	28.1 (1.3)	13489	24.4 (0.4)
Secondary/higher	2420	17.1 (0.8)	60789	44.8 (0.6)	12091	45.8 (1.3)	16022	50.9 (0.7)	3734	87.3 (0.9)	10021	71.9 (1.3)	34220	75.6 (0.4)
Urban/rural residence														
Urban	6407	42.6 (2.1)	51030	32.4 (1.0)	9256	36.4 (1.8)	13349	41.6 (1.5)	3102	84.2 (1.8)	9919	72.9 (2.1)	34210	77.5 (0.8)
Rural	8476	57.4 (2.1)	62033	67.6 (1.0)	19645	63.6 (1.8)	18923	58.4 (1.5)	1425	15.8 (1.8)	4564	27.1 (2.1)	13499	22.5 (0.8)
Age group (years)														
15-24	5077	34.6 (0.5)	41156	36.7 (0.2)	10995	37.9 (0.4)	5361	16.3 (0.3)	506	11.8 (0.7)	4903	33.5 (0.5)	14827	30.7 (0.3)
25-34	5175	34.7 (0.5)	34726	30.6 (0.2)	8930	31.1 (0.3)	11414	35.4 (0.3)	1726	37.0 (1.1)	4091	28.5 (0.6)	12259	25.6 (0.3)
35-49	4631	30.7 (0.4)	37181	32.7 (0.2)	8976	31.0 (0.4)	15497	48.2 (0.4)	2295	51.2 (1.2)	5489	38.0 (0.6)	16864	36.3 (0.3)
Children born														
0	3335	22.9 (0.5)	35590	28.1 (0.2)	8550	30.6 (0.6)	2388	7.1 (0.2)	307	6.4 (0.6)	4466	33.0 (0.7)	16134	35.1 (0.3)
1-3	5215	35.3 (0.5)	52839	47.1 (0.3)	8774	30.3 (0.4)	17759	57.2 (0.5)	1693	40.5 (1.1)	6945	47.9 (0.7)	24409	52.6 (0.3)
4-6	4055	27.1 (0.4)	20577	20.3 (0.2)	6821	23.4 (0.3)	9386	28.4 (0.3)	1636	37.6 (1.0)	2351	14.9 (0.5)	6010	10.7 (0.2)
7+	2278	14.7 (0.4)	4057	4.6 (0.1)	4756	15.6 (0.4)	2739	7.2 (0.2)	891	15.5 (0.9)	721	4.2 (0.3)	1156	1.6 (0.1)
Wealth by education level														
None/primary														
Poorer 40%	5334	51.9 (1.6)	23277	70.8 (0.8)	10240	73.0 (1.5)	10338	75.7 (1.0)	563	80.2 (3.0)	2590	74.9 (2.4)	10001	79.0 (0.9)
Richer 40%	4510	48.1 (1.6)	15980	29.2 (0.8)	3108	27.0 (1.5)	2753	24.3 (1.0)	82	19.8 (3.0)	711	25.1 (2.4)	1448	21.0 (0.9)
Secondary/higher														
Poorer 40%	153	6.1 (0.7)	5344	16.5 (0.6)	1661	12.7 (1.0)	3032	21.1 (0.9)	1791	48.6 (2.7)	1388	13.9 (1.3)	14421	46.7 (1.0)
Richer 40%	2044	93.9 (0.7)	46694	83.5 (0.6)	8190	87.3 (1.0)	9850	78.9 (0.9)	1111	51.4 (2.7)	5970	86.1 (1.3)	12102	53.3 (1.0)

[1] SE = standard error of the estimated proportion x 100.

Table 3 Prevalence of obesity by sociodemographic characteristic in each country, DHS data.

	Benin **N=14883**		**India** **N=113063**		**Nigeria** **N=28901**		**Egypt** **N=32272**		**Jordan** **N=4527**		**Peru** **N=14483**		**Colombia** **N=47709**	
	N obese	**% (SE[1])**	**N obese**	**% (SE[1])**	**N obese**	**% (SE[1])**	**N obese**	**% (SE[1])**	**N obese**	**% (SE[1])**	**N obese**	**% (SE[1])**	**N obese**	**% (SE[1])**
Income bracket	LI		LI		LI		MI		MI		MI		MI	
Education														
None/primary	567	4.9 (0.3)	1194	1.7 (0.1)	679	4.4 (0.2)	6682	44.4 (0.7)	355	47.3 (3.3)	799	17.2 (1.1)	2910	21.9 (0.5)
Secondary/higher	226	9.8 (0.8)	2794	4.2 (0.2)	873	7.9 (0.4)	6444	41.7 (0.7)	1180	28.0 (1.2)	1377	13.2 (0.5)	4226	11.6 (0.2)
Wealth quintile														
Poorest 20%	30	1.1 (0.2)	31	0.2 (0.0)	104	1.8 (0.2)	1938	30.6 (0.8)	415	30.4 (1.9)	49	4.3 (0.7)	1712	14.0 (0.5)
Poorer 20%	41	1.4 (0.2)	73	0.5 (0.1)	134	2.3 (0.2)	2285	37.6 (0.9)	344	27.7 (2.1)	323	9.4 (0.7)	2095	16.1 (0.5)
Middle 20%	89	3.2 (0.4)	219	0.9 (0.1)	235	4.1 (0.3)	2654	44.5 (0.9)	362	31.4 (2.7)	626	15.5 (0.9)	1497	14.6 (0.4)
Richer 20%	183	5.9 (0.4)	823	2.9 (0.1)	393	6.8 (0.4)	2988	49.2 (1.0)	271	34.7 (2.4)	570	18.0 (1.0)	1101	13.9 (0.5)
Richest 20%	450	13.7 (0.7)	2842	8.4 (0.3)	686	12.8 (0.6)	3261	51.4 (1.1)	143	28.4 (4.1)	608	15.6 (0.9)	731	11.9 (0.5)
Urban/rural residence														
Urban	570	9.7 (0.6)	3083	6.1 (0.2)	831	9.5 (0.5)	6416	49.5 (0.8)	1044	29.4 (1.4)	1691	16.2 (0.6)	5048	13.9 (0.2)
Rural	223	2.7 (0.2)	905	1.2 (0.1)	721	3.9 (0.2)	6710	38.4 (0.8)	491	36.3 (1.9)	485	9.2 (0.7)	2088	14.9 (0.5)
Age group														
15-24	85	1.8 (0.2)	281	0.5 (0.0)	190	1.7 (0.1)	895	17.8 (0.7)	60	11.8 (2.2)	205	3.9 (0.4)	883	5.3 (0.2)
25-34	265	5.5 (0.4)	1071	2.5 (0.1)	516	6.5 (0.4)	3775	34.8 (0.7)	411	21.2 (1.5)	606	13.8 (0.9)	1985	14.7 (0.4)
35-49	443	10.3 (0.6)	2636	5.7 (0.2)	846	10.6 (0.5)	8456	57.6 (0.7)	1064	41.5 (1.8)	1365	23.9 (1.1)	4268	23.9 (0.4)
Children born														
0	83	2.8 (0.4)	444	1.0 (0.1)	239	2.8 (0.2)	653	29.1 (1.2)	72	17.8 (3.4)	201	4.2 (0.5)	856	5.5 (0.2)
1-3	304	6.3 (0.4)	2676	4.0 (0.2)	473	6.4 (0.4)	6610	39.4 (0.7)	385	21.6 (1.6)	1255	17.6 (0.8)	4387	17.0 (0.3)
4-6	287	7.7 (0.6)	749	2.7 (0.2)	513	8.7 (0.5)	4594	52.0 (0.8)	619	33.0 (1.9)	571	23.7 (1.5)	1597	26.7 (0.8)
7+	119	5.2 (0.5)	119	2.1 (0.3)	327	7.3 (0.5)	1269	50.1 (1.2)	459	52.8 (2.8)	149	22.7 (2.7)	296	26.9 (1.8)
Wealth by education level														
None/primary														
Poorer 40%	69	1.3 (0.2)	90	0.4 (0.0)	213	2.1 (0.2)	3491	36.8 (0.8)	226	42.3 (3.9)	270	8.7 (0.7)	2027	20.6 (0.6)
Richer 40%	415	9.6 (0.5)	944	5.5 (0.3)	316	10.5 (0.6)	1651	60.4 (1.2)	48	56.6 (9.3)	243	34.9 (3.3)	365	24.0 (1.3)
Secondary/higher														
Poorer 40%	2	1.2 (0.9)	14	0.3 (0.1)	25	1.6 (0.4)	732	25.4 (1.0)	533	25.8 (1.3)	102	6.9 (0.9)	1780	10.8 (1.1)
Richer 40%	218	11.1 (0.8)	2721	5.8 (0.2)	763	9.7 (0.5)	4598	47.3 (0.9)	366	30.1 (2.4)	935	14.5 (0.7)	1467	12.1 (1.1)

[1] SE = standard error of the estimated proportion x 100.

Table 4 Separate, independent and interaction effects of education and wealth on obesity in the low-income countries, DHS data.

	Benin **N=14883** **OR (95%CI)** **Unadjusted**	**Adjusted[1]**	**India** **N=113063** **OR (95%CI)** **Unadjusted**	**Adjusted[1]**	**Nigeria** **N=28901** **OR (95%CI)** **Unadjusted**	**Adjusted[1]**
Model using education						
Education (level)						
None/primary	1	1	1	1	1	1
Secondary/higher	2.16 (1.84-2.53)	2.01 (1.67-2.44)	2.06 (1.92-2.21)	2.23 (2.07-2.41)	1.84 (1.68-2.04)	2.39 (2.11-2.70)
Model using wealth						
Wealth quintile (linear)	2.09 (1.94-2.23)	1.99 (1.84-2.16)	2.77 (2.65-2.89)	2.41 (2.30-2.53)	1.76 (1.68-1.83)	1.80 (1.70-1.90)
Model both education and wealth						
Education (level)						
None/primary		1		1		1
Secondary/higher		1.26 (1.04-2.12)		1.18 (1.09-1.28)		1.32 (1.16-1.52)
Wealth quintile (linear)		1.95 (1.79-2.12)		2.33 (2.23-2.46)		1.71 (1.62-1.81)
Model including education and wealth and a wealth-by-education interaction[2]						
Wealth effect within education level[3]						
None/primary		1.98 (1.81-2.15)		2.25 (2.11-2.39)		1.72 (1.61-1.84)
Secondary/higher		1.67 (1.30-2.16)		2.48 (2.29-2.70)		1.70 (1.55-1.86)
Interaction estimate[4]		0.85 (0.65- 1.10)		1.10 (1.00-1.21)		0.99 (0.89-1.10)
P-value for the interaction estimate[5]		0.2		0.06		0.8

[1] Estimates adjusted for age group, urban/rural residence, and parity

[2] Estimates for education not shown in this section of the table

[3] OR for obesity associated with an increase in one wealth quintile within each education level calculated using the interaction estimate obtained from the model including an interaction between education and wealth

[4] Wealth effect in the secondary/higher education divided by the wealth effect in the no/primary education group e.g. for Benin, 0.85=1.67/1.98)

[5] Test of whether the wealth effects differ by education level

Table 5 Separate, independent and interaction effects of education and wealth on obesity in the middle-income countries, DHS data.

	Egypt		**Jordan**		**Peru**		**Colombia**	
	N=32272		**N=4527**		**N=14483**		**N=47709**	
	OR (95%CI)		**OR (95%CI)**		**OR (95%CI)**		**OR (95%CI)**	
	Unadjusted	**Adjusted[1]**	**Unadjusted**	**Adjusted[1]**	**Unadjusted**	**Adjusted[1]**	**Unadjusted**	**Adjusted[1]**
Model using education								
Education level								
None/primary	1	1	1	1	1	1	1	1
Secondary/higher	0.96 (0.92-1.00)	1.15 (1.09-1.22)	0.57 (0.49-0.67)	0.98 (0.85-1.12)	0.73 (0.66-0.80)	0.97 (0.86-1.09)	0.51 (0.49-0.54)	0.79 (0.74-0.84)
Model using wealth								
Wealth quintile (linear)	1.28 (1.26-1.30)	1.26 (1.23-1.29)	1.02 (0.98-1.07)	0.95 (0.90-0.99)	1.23 (1.18-1.27)	1.21 (1.15-1.28)	0.96 (0.94-0.98)	0.94 (0.91-0.96)
Model using both education and wealth								
Education (level)								
None/primary		1		1		1		1
Secondary/higher		0.86 (0.81-0.92)		0.86 (0.72-1.02)		0.84 (0.74-0.95)		0.81 (0.76-0.86)
Wealth quintile (linear)		1.30 (1.27-1.33)		0.96 (0.91-1.00)		1.24 (1.17-1.31)		0.96 (0.93-0.98)
Model including education, wealth and a wealth-by-education interaction[2]								
Wealth effect within education level[3]								
None/primary		1.39 (1.35-1.43)		1.27 (1.11-1.44)		1.65 (1.52-1.80)		1.09 (1.04-1.13)
Secondary/higher		1.19 (1.16-1.23)		0.91 (0.86-0.96)		1.08 (1.02-1.15)		0.92 (0.89-.94)
Interaction estimate[4]		0.85 (0.82-0.89)		0.72 (0.62-0.83)		0.66 (0.60-0.72)		0.84 (0.81-0.88)
P-value for the interaction estimate[5]		<0.001		<0.001		<0.001		<0.001

[1] Estimates adjusted for age group, urban/rural residence, and parity

[2] Estimates for education not shown in this section of the table

[3] OR for obesity associated with an increase in one wealth quintile within each education level calculated using the interaction estimate obtained from the model including an interaction between education and wealth

[4] Wealth effect in the secondary/higher education divided by the wealth effect in the no/primary education group e.g. for Egypt, 0.86=1.19/1.39)

[5] Test of whether the wealth effects differ by education level

Table 6 Effect of wealth on obesity within three education levels in the middle-income countries, DHS data.

	Egypt **N=32272** **OR (95%CI)**^{1,2}	**Jordan** **N=4527** **OR (95%CI)**^{1,2}	**Peru** **N=14483** **OR (95%CI)**^{1,2}	**Colombia** **N=47709** **OR (95%CI)**^{1,2}
Wealth effect within education level [3]				
None/primary	1.39 (1.35-1.43)	1.27 (1.11-1.45)	1.65 (1.51-1.80)	1.09 (1.04-1.14)
Secondary	1.25 (1.21-1.29)	0.97 (0.90-1.04)	1.15 (1.07-1.25)	0.94 (0.91-0.98)
Higher	1.02 (0.93-1.13)	0.84 (0.76-0.93)	1.10 (0.98-1.23)	0.86 (0.82-0.91)
P-value for interaction[4]	*<0.001*	*<0.001*	*<0.001*	*<0.0001*

[1] Model = education (three levels)*wealth quintile (continuous) + age group + urban/rural residence + parity

[2] ORs represent the effect of an increase in one wealth quintile on the odds of obesity within each education level

[3] Estimates for education not shown

[4] Test of whether the wealth effects differ by education level

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Perceptions of body weight in relation to weight, physical activity, and socioeconomic status among women in Qatar

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Abstract

Background

In the context of the epidemiological transition, obesity has become one of the biggest public health concerns in countries of the Arabian Gulf, with Kuwait and the United Arab Emirates experiencing some of the highest levels of obesity in the world. The 2012 Qatar Stepwise survey reported that 41.4% of adults in the country were obese (BMI ≥30 kg/m2). Similar to most Arab countries, obesity in Qatar is higher among women compared to men. With anecdotal evidence pointing to increased demand for bariatric surgery, promotion of healthy lifestyles and prevention of obesity are priority public health actions. In turn, health behaviors are influenced by knowledge and perception of risk, among other factors. Perceptions of body weight are generally understudied. This study explored women's reported body mass index (BMI) levels, relevant behaviors, such as dieting and engaging in physical activity, perceptions of body weight, self-assessment of general health status, and preferred sources of health-related information.

Methods

A cross-sectional survey of a nationally representative sample of 1216 ever-married Qatari women aged 18-64 years was conducted in 2011. A structured questionnaire was pre-tested before use and administered in face-to-face interviews.

Results

Only about 1 in 4 women reported a BMI that was within the normal range according to the WHO classification (23.9%); 24.9% were overweight (pre-obese), and 41.1% were obese. Perceptions of weight-for-height were incongruent with reported BMI in over one half of overweight (pre-obese) women and a quarter of obese women. More obese women reported lower levels of self-rated health. Health professionals were the most important source of information for women in all age groups. The findings of the survey should contribute to the design of appropriate interventions among women.

Introduction

Following the discovery of its oil and gas reserves in the mid-1900's, the State of Qatar, like other countries of the Arabian Gulf, experienced rapid and substantial economic growth (Ng, Zaghloul, Ali, & Popkin, 2010) and is now one of the wealthiest countries in the world (Ali, Nikoloski, Reka, Gjebrea, & Mossialos, 2014). Alongside economic growth, the country has also experienced an epidemiological transition, with a decline in communicable and neonatal diseases and an increase in the burden of noncommunicable diseases and road traffic accidents (Mokdad & Lopez, 2014). The 2012 Qatar Stepwise Survey for chronic disease risk factor surveillance identified a level of obesity (BMI ≥30 kg/m2) reaching 41.4% in adults (Haj Bakri & Al-Thani, 2013), with a higher prevalence among women compared to men. Comparable estimates showing high levels of overweight and obesity among men and women can also be traced back to studies from 2003 (Ng, Zaghloul, Ali, & Popkin, 2010) and 2006 (Ali, Nikoloski, Reka, Gjebrea, & Mossialos, 2014). The unrelenting burden of chronic noncommunicable diseases has prompted calls for strengthening preventive interventions focusing on lifestyle-related risk factors, including unhealthy diets and insufficient physical activity (Mokdad & Lopez, 2014).

Changing behaviors, such as diet and physical activity, can be enormously challenging for an individual. In addition to identifying individual risk factors, understanding perceptions of weight, knowledge of preventive health behaviors, and preferred sources of health-related information can be helpful in designing effective interventions. In this presentation, we report on a population-based study of a nationally-representative sample of ever-married Qatari women (aged 18-49 years) investigating one of the key drivers of the noncommunicable disease epidemic in Qatar, namely obesity. Though few studies have reported the high prevalence of overweight and obesity in Qatar, published reports of obesity risk factors and perceptions in population-based samples are extremely scarce. We also report on the perceptions of body weight in relation to self-reported health status and preferred sources of information among women. Understanding perceptions of weight and behaviors, such as physical activity and diet, is key to customizing effective interventions.

Objectives

The objectives of this study were (1) to understand risk factors associated with overweight and obesity in a population of ever-married Qatari women in the reproductive age (2) to investigate women's perceptions of their weight in relation to their actual body weight and other socio-demographic characteristics and (3) to describe the relationship between obesity and relevant health behaviors.

Methods

This study was part of a population-based survey of ever-married Qatari women aged 18-49 years conducted in 2011 on a nationally-representative sample of women drawn from all seven municipalities in Qatar. Respondents were selected via a two-stage probability sampling method. In the first stage, municipalities were divided into administrative strata called "zones", and households were randomly selected from each zone with proportional stratification. In the second stage, one female was selected randomly from the roster of ever-married females aged 18-49 years in the selected household. Sampling weights were constructed taking into consideration base weights reflecting sample selection probability, adjustment for non-response, and calibration in line with the 2010 Qatar Census population estimates.

Data collection was conducted using computer assisted personal interviewing (CAPI).

The questionnaire administered to the selected respondent contained modules on household and individual demographic characteristics, marriage, fertility, and reported health behaviors. Height and weight were reported by respondents, and BMI was calculated based on the reported values. WHO-defined cutoffs were used to categorize normal weight (BMI 18.50 - 24.99), pre-obese overweight (BMI 25.00 - 29.99), and obesity (BMI ≥30.00). Selected questions, especially in the marriage and fertility modules, were used from the Demographic and Health Survey (DHS). Other questions were specifically developed for the survey and pre-tested during the piloting phase.

The questionnaire was pre-tested with 50 interviews to ascertain clarity, appropriateness and acceptability of questions in the local context. Female interviewers were trained on the content of the questionnaire and on the use of *Blaise* survey management software for CAPI. Fieldwork was carried out between May 2 and 30, 2011.

Analysis was conducted using SPSS and STATA statistical software packages. Pregnant women were excluded from the analysis of the results. Univariate analysis was used to describe the characteristics of the sample (means and percentages). Bivariate (chi-squared and *t*-test) and multivariate (logistic regression) analyses were conducted to describe the association between BMI and various risk factors. A variable was constructed to represent women who were overweight or obese according to reported height and weight but who perceived their height and weight to be well matched (i.e. to have a BMI within the normal range).

Results

A total of 1216 respondents answered questions on the health module, and the total survey response rate was 68%. Characteristics of respondents in the sample corresponded to national estimates. The mean age of respondents was 35.6± 8.4 (median 37). In line with national estimates, 35.9% of women reported being currently in employment, and 30.7%, 34.7% and 34.5% had below secondary, secondary, and university education, respectively. The average number of children as 4.7± 2.4, and 88.6% of the sample reported being married at the time of the survey.

In this sample of ever-married women in the reproductive age, only about 1 in 4 reported a BMI that was within the normal range according to the WHO classification (23.9%); 24.9% were overweight (pre-obese), and 41.1% were obese. Alarmingly, 15.8% of all respondents reported a body mass index greater than 35.

Bivariate analysis showed significant associations in the expected directions. BMI was significantly positively associated with age, but inversely associated with education, household monthly income, and number of children. In multivariate regression analysis, all factors, except household income were significantly associated with obesity.

Women's perception of their body weight varied by their actual weight. The majority of women whose reported BMI was within the normal limits correctly identified their height and weight as being well matched (76.9%), compared to 44.6% and 75.2% of overweight (pre-obese) and obese women, respectively. Slightly over one half of overweight women (BMI 25-29.9) and a quarter of obese women (BMI 30 and above) held an incorrect perception of their weight.

Women who were obese were more likely to report being on a diet in the year before the survey and to engage in physical activity. More obese women reported lower health self-ratings compared to non-obese women.

For all women (regardless of obesity), health professionals were reported to be the most important source of information on health-related matters. This source was followed by television for the older women, but internet for the younger age groups. At all BMI levels, age and education were the determinants of women's preferred source of health information.

Discussion

Obesity has been identified as an important health issue and a main driver of the noncommunicable disease epidemic in Qatar, especially among women. Few population-based studies have been conducted to describe and understand the behaviors of obese and overweight women, and therefore to design appropriate and effective interventions.

The present study was part of a population–based survey of ever-married Qatari women in the reproductive age. Women were asked to report on their height and weight, but also on various behaviors, including seeking preventive health services, physical activity, dieting, and sources of health information. Importantly, women were also asked about their own perceptions of their body weight. While women with normal and obese levels of body mass index seemed to perceive their weight relatively accurately, women who were overweight (pre-obese) tended to perceive their weight as normal. This is important for targeting this particular group of women before progressing to obesity.

Obese and overweight women were predictably more likely to report engaging in physical activity and dieting, and they reported lower self-related health.

The present study has several limitations, including the fact that height and weight are reported rather than measured. However, the average reported weight and height, and the prevalence of overweight and obesity were closely compatible with national estimates from surveys using anthropometric measures. The study makes a number of contributions, including exploration of individual characteristics and behaviors of overweight and obese women and identification of women with incorrect perceptions of their body weight. The presentation will elaborate on the implications of the findings, and on the need for future studies using anthropometric measures as well as in-depth qualitative investigation of women's views on body shapes and the challenges of maintaining a healthy weight.

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Dyslipidemia among Arabian Gulf and its impact on cardiovascular risk outcome

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Abstract

Cardiovascular disease (CVD) is the most common cause of death in the In the states of The Co-operation Council for the Arab States of the Gulf (GCC), accounting for up to 45% of all deaths in these predominantly young populations. The INTERHEART study, found that the mean age of the first presentation of acute myocardial infarction was 10 years younger in the Middle East countries compared with the other regions of the world. These findings were attributed to the early onset of CVD risk factors of which the two most prevalent were smoking and dyslipidemia. There is high prevalence of diabetes mellitus in the Gulf States in which diabetic dyslipidemia is commonly demonstrated in these patients. In the Gulf Registry of Acute Coronary Events (Gulf RACE), the overall prevalence of low HDL-C was 62% and was associated with higher in-hospital mortality and cardiogenic shock. In the Centralized pan-Middle East Survey on the under treatment of hypercholesterolemia (CEPHEUS) Survey conducted in 6 Arabian Gulf Countries, LDL-C attainment was 52%. There is suboptimal management of dyslipidemia across Arabian Gulf Countries. More aggressive treatment management will be required which includes aggressive life style modifications, adherence to guidelines and the use of optimal lipid lowering therapies.

In the states that constitute the Cooperation Council for the Arab States of the Gulf (GCC), cardiovascular disease (CVD) is considered the most common cause of death, accounting for up to 45% of all deaths[1]. CVD risk factors like dyslipidemia and smoking were prevalent in young populations in the region with a mean age of the first presentation of acute myocardial infarction (AMI) around 10 years younger in the Middle East countries compared with the other regions of the world as shown by the INTERHEART study.[2]

There is high correlation between elevated low density lipoprotein (LDL-C) levels and the risk for CVD in several populations worldwide[3]. Therefore, LDL-C is accepted by several guidelines like the National Cholesterol Education Program Adult Management Panel (NCEP ATP) III guideline and the 2004 updated NCEP ATP III guidelines, to be the primary target of cholesterol-lowering therapy[4,5]. The recommended LDL-C goals are based on the risk category of the individual patient as a key target in reducing CVD.

According to the National Cholesterol Education Program (NCEP) guidelines[5] and the joint Consensus Statement of the American Diabetes Association (ADA) and American College of Cardiology Foundation (ACC), neither high density lipoprotein cholesterol (Non-HDL-C) nor apolipoprotein B (ApoB) is considered as a secondary therapeutic target in patients with atherogenic dyslipidaemia and cardiometabolic risk. An apo B level <0.90 g/L is recommended for patients without diabetes or known cardiovascular disease (CVD) but with ≥2 major CVD risk factors, or with diabetes and without major CVD risk factors and Apo B level <0.80 g/L is recommended for patients with CVD or diabetes plus one or more additional major CVD risk factor.[6]

High residual risk of atherothrombotic events remains, high in high-risk individuals even after achieving optimal LDL cholesterol levels. Therefore, the NCEP ATP III recommends therapeutic intervention targeting low high density lipoprotein cholesterol (HDL-C) and high triglyceride (TG) in patients with high risk for CVD and combined dyslipidemia.[7]

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There is high prevalence of diabetes mellitus in the GCC where diabetic dyslipidemia is commonly demonstrated in these population. The GCC have some of the highest rates of type 2 diabetes in the world. Five of the IDF's 'top 10' countries for diabetes prevalence in 2010 and in 2030 are in this region.[8]

In the Centralized Pan-Middle East Survey on the undertreatment of hypercholesterolemia (CEPHEUS) in Arabian Gulf States, patients were classified into high and highest risk according to the joint Consensus Statement of the ADA and ACC. LDL-C target was achieved in 25%, non-HDL-C in 36% and apo B in 38% of patients in the highest risk compared with LDL-C 46%, non-HDL-C 58% and apo B 51% in the high risk patients. The factors that could influence the achievement of these therapeutic lipid targets included patients in the high-risk categories not receiving optimum doses of statins, treating physicians not adhering to guidelines as well as difficulties with patient compliance.[9] The conclusion from this study was therefore, high risk patients with higher number of risk factors should receive more aggressive therapy to achieve lipoprotein targets, In addition treating physicians required to be continuously educated and updated about the international guidelines on lipoproteins therapeutic targets and the optimal use of LLDs therapy.

In the same study the overall prevalence of low HDL-C was 49%. Low HDL-C was more prevalent in female compared to male (53% *vs* 46%; $p<0.001$). In the high risk group the prevalence of low HDL-C was 40% compared to 53% in the highest risk group patients ($p<0.001$). The prevalence of low HDL-C in the high risk group in patients who achieved LDL-C target of <2.6 mmol/l was 48% compared to 52% in those who didn't achieved LDL-C target of <2.6 mmol/l ($p=0.073$). In the highest risk group the prevalence of low HDL-C in patients who achieved LDL-C target of <1.8 mmol/l was 28% compared to 72% in those who didn't achieved LDL-C target of <1.8 mmol/l ($p<0.001$). The conclusion from this study was high prevalence of low HDL-C and is more seen in the highest risk group and female patients. These patients may remain at increased residual risk for CVD and therefore they may benefit from therapeutic intervention targeting HDL-C. (Unpublished data)

In the Gulf Registry of Acute Coronary Events (Gulf RACE), the prevalence of low HDL-C (62%) in ACS patients was the highest among other reported studies on ACS, which ranged from 28 to 57%.[10] Low HDL-C was associated with significantly higher in-hospital mortality and cardiogenic shock. Higher body mass index (BMI), prior MI, diabetes mellitus, smoking, and renal impairment were predictors of low HDL-C. Possible explanation for the low HDL-C in this population could be attributed to the high prevalence of metabolic syndrome in the general population in the GCC,[11] which is 10-15% higher than in most developed countries and in addition, to the high prevalence of obesity[12] in ACS in this region.

Conclusions

There is suboptimal management of dyslipidemia across Arabian Gulf Countries. More aggressive treatment management will be required which includes aggressive life style modifications, adherence to guidelines and the use of optimal lipid lowering therapies.

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Unhealthy weight in the Arab region: prevalence, socio-economic factors, gender, and social context

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In recent years, the problem of overweight has gained remarkable visibility as a vast literature has highlighted rapid and dramatic increases in the prevalence of high body-mass index (BMI), and shown that the expansion of waistlines was not limited to high-income countries, but was very much a global problem (Finucane et al., 2011; Barry M Popkin, Adair, & Ng, 2012; B. M. Popkin & Slining, 2013). This presentation provides a synthesis of the available research on overweight and obesity in the Arab region, with special attention to gender and the social context.

1. Overweight and obesity are frequent, and increasing

According to the most recent Global Burden of Disease Study 2013, conducted by the Institute of Health Metrics and Evaluation (IHME) countries of the Middle East and North Africa region have seen large increases in obesity, and several countries—Bahrain, Egypt, Saudi Arabia, Oman, and Kuwait—are among those with the largest increases in obesity globally, and in the region as a whole, more than 58% of men and 65% of women age 20 or older were either overweight or obese(M. Ng et al., 2014). The prevalence of high body mass index (≥25 kg/m2) ranges from 25% to 82%, with a higher prevalence among women (Musaiger, Int J Gen Obesity, 2012).

These statistics are all the more alarming as they relate to increasing trends over time (Belahsen & Rguibi, 2006) including in children (Mirmiran, Sherafat-Kazemzadeh, Jalali-Farahani, & Azizi, 2010). In fact, the Global School-based Student Health Surveys (GSHS) find levels of overweight/obesity among adolescents of nearly 50% in countries of the Gulf, low levels (<16%) in countries such as Morocco, Sudan and Yemen, and 1/4 to 1/3 in other countries (Figure 1). A systematic review found that rates of overweight/obesity among children and adolescents (22% for boys and 28% for girls) in MENA were exceeded only by North America and South Latin America. This is of particular concern as childhood obesity has been shown to predispose to future adult overweight, obesity and non-communicable disease risk (Brisbois, Farmer, & McCargar, 2012; Dietz, 1998; Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001; Parsons, Power, Logan, & Summerbelt, 1999).

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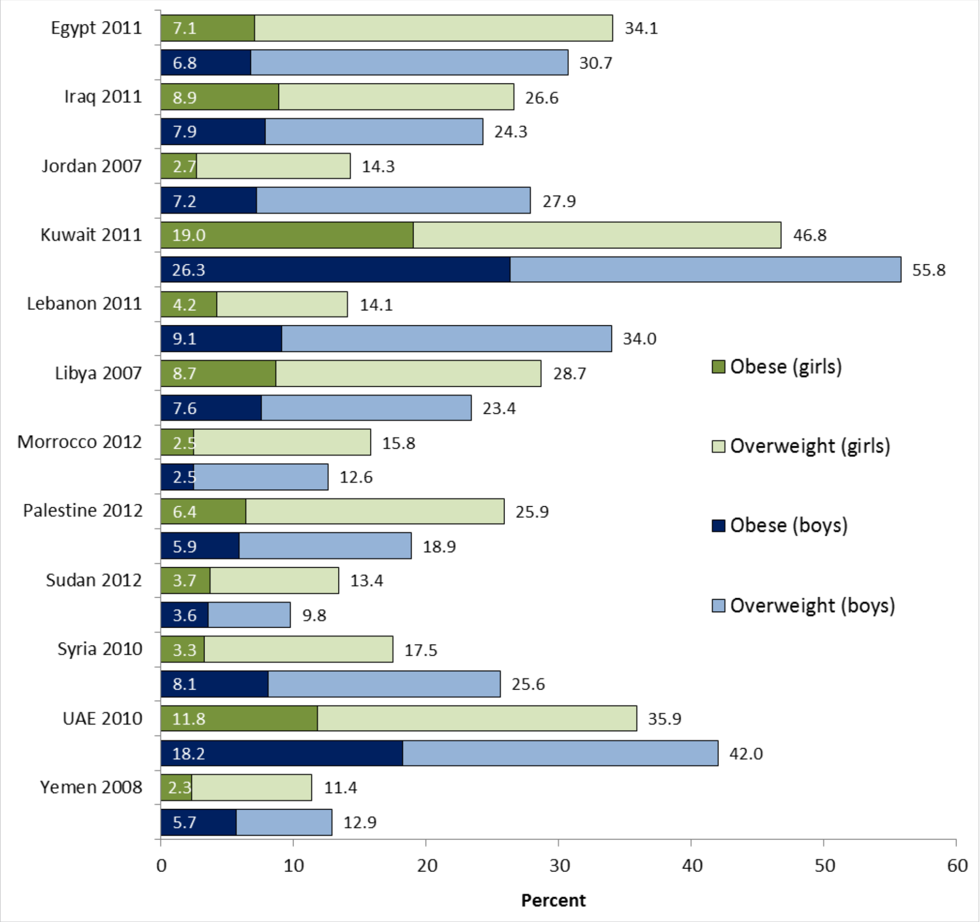
Figure 1: Percentage of girls and boys aged 13-15, who were overweight or obese, most recent WHO Global School-Based Health Surveys, 2007-2012*



* Source: WHO Global school-based student health surveys, fact sheets. Compiled in (Obermeyer, Bott, & Sassine)

2. Overweight, obesity, and undernutrition are potentially serious health problems

The overweight epidemic increases the risk for non-communicable disease, in particular for metabolic syndrome including its components; high blood pressure, cardiovascular/circulatory diseases, and diabetes, which appear to be higher in the Arab region than elsewhere.

A recent review of hypertension in the Arab region showed that the overall estimated prevalence of hypertension derived from 11 studies in 10 Arab countries was 29.5% (n = 45 379), which is higher than both the USA (28%) and sub-Saharan African (27.6%) (Tailakh et al., 2014).

Diabetes is also on the rise in the region with 34.6 million people affected, and elevated prevalence rates, particularly in countries of the Gulf, KSA (23.9%), Kuwait (23.1%), Qatar(22.9%), Bahrain (21.8%), and the UAE (19%) (Majeed et al., 2014).

It is important to note that while the burden of overweight and obesity is high in the Arab region as a whole, problems of undernutrition still exist in a number of countries (Atinmo, Mirmiran, Oyewole, Belahsen, & Serra-Majem, 2009). The double burden, which refers to the coexistence of under- and over-nutrition and micronutrient deficiencies, particularly anemia has been observed within the same countries, household (A Aitsi-Selmi, Benova, Sholkamy, & Marmot, 2009; Atinmo et al., 2009; Eckhardt, Torheim, Monterrubio, Barquera, & Ruel, 2008; El Taguri et al., 2009; Galal, 2002) and sometimes within the same individual (Atinmo et al., 2009; Gartner et al., 2014).

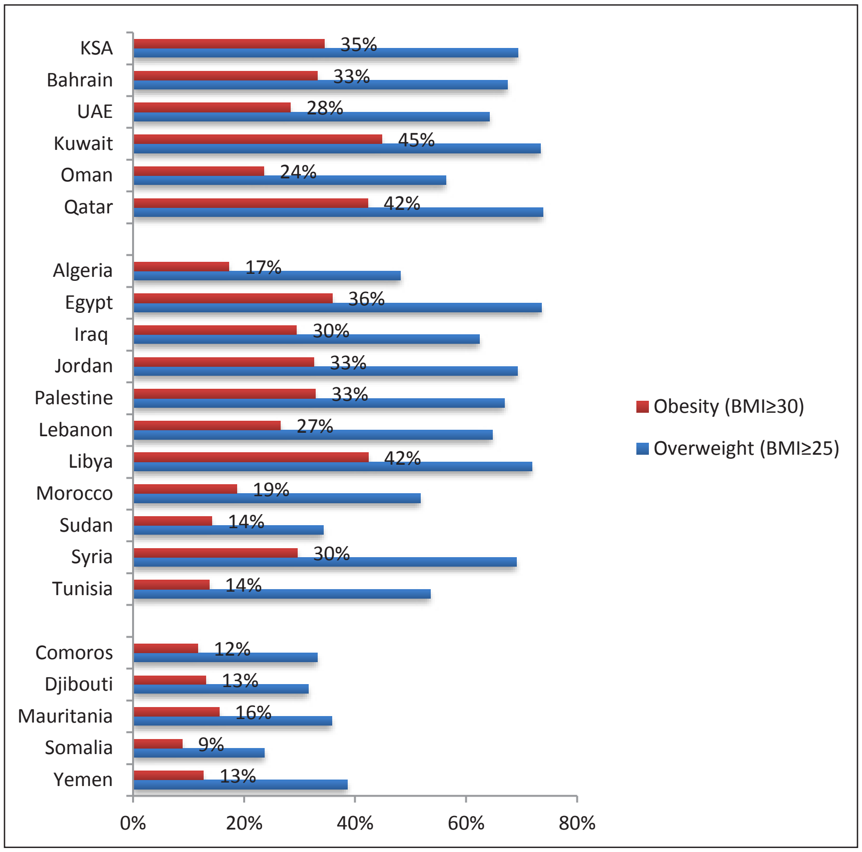
3. The nutrition transition and regional differences in the Arab region

Increases in BMI are seen historically as consequences of the "nutrition transition," the process whereby global changes in food production, trade, and labor, have transformed the supply and demand for food and altered lifestyles, leading to increased consumption of fats, sugars, processed grains and animal protein, reduced consumption of fruits and vegetables, and insufficient physical activity (Bleich, Cutler, Murray, & Adams, 2008; Barry M Popkin & Gordon-Larsen, 2004; B. M. Popkin & Slining, 2013).

In countries of the Arab world, over the last two decades, there has been aggressive marketing and increased consumption of fast foods and sugar-dense beverages. Technological advances and prosperity have lead to a decrease in level of activity, Western style fast food, and sedentary lifestyles—all these represent what has been referred to as the "obesogenic environment" defined by the nutrition transition (Alhyas, McKay, Balasanthiran, & Majeed, 2011; Badran & Laher, 2011; Mokdad et al., 2014).

Indeed, country statistics on overweight and obesity for the region cluster according to the stage of the nutrition transition (see Figure 2). Countries of the Gulf (top panel) are at the most advanced stage of the transition, with very high rates of overweight and obesity, while poor countries (bottom panel) are at an early stage, and show low overweight along with persistent undernutrition. Other countries are in between, in the midst of the transition.

Figure 2: Prevalence of adult overweight and obesity in the Arab league countries



(Graph compiled using the GBD data visualization tool of the Institute of Health Metrics, University of Washington)

4. Social determinants of overweight and obesity

In general, overweight and obesity are higher in urban than rural areas. This has been attributed to the more active life of rural residents, compared to the urban ones, to the lower availability of food that is high in fats, sugar, and carbohydrates, to the extent to which traditional diets are preserved, and conversely to patterns of fast-food consumption. (Badran & Laher, 2011). Comparative analyses also indicate that part of the urban-rural differences in BMI may be attributable to differentials in wealth (Neuman, Kawachi, Gortmaker, & Subramanian, 2013).

Wealth has been associated with higher overweight and obesity, reflecting the ability to purchase richer manufactured foods, labor-saving devices, means of transportation, and a generally more sedentary lifestyle. This is observed in statistics showing higher rates of obesity among the affluent than among poorer people in Egypt, Saudi Arabia, Kuwait and Jordan (Al-Kandari, 2006; Al-Othaimeen, Al-Nozha, & Osman, 2007; Musaiger, 1993; Salazar-Martinez et al., 2006).

The association of overweight/ obesity with education is complex and not linear. In the early phases of the nutrition transition, the more affluent and educated tend to gain weight, but the association reverses over time, and illiteracy comes to be associated with obesity, as is the case in transitional Arab countries. For example, 51% of illiterate Syrians are obese compared to 28% of people with a university education; Jordanians with less than 12 years of education are approximately 1.6 times as likely to be obese than compatriots with more than 12 years of education. Similarly, Lebanese with limited formal education are twice as likely to be obese (Badran & Laher, 2011).

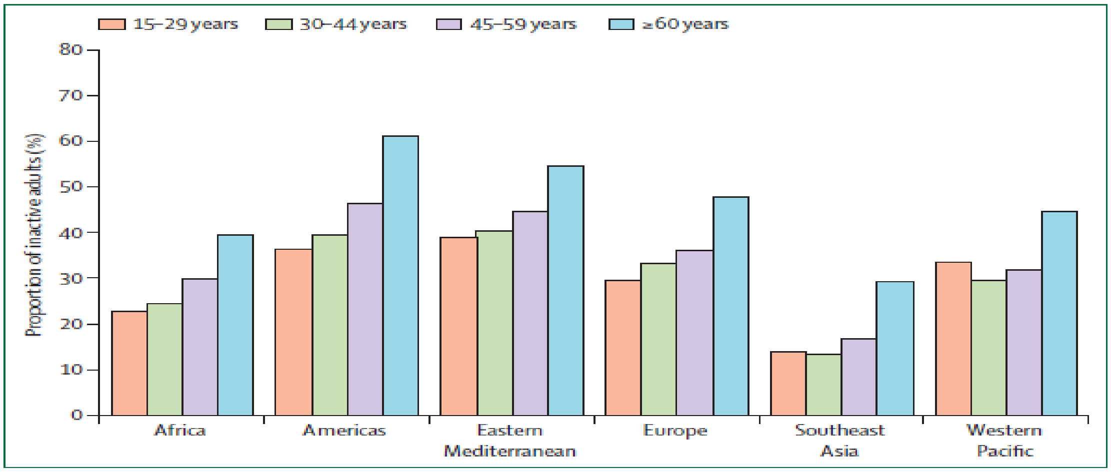
A recent study by Aitsi-Selmi et al (A. Aitsi-Selmi, Bell, Shipley, & Marmot, 2014) aimed to assess the separate and inter-related associations of education and household wealth in relation to obesity in women in Egypt and Jordan. It showed an interaction between education and wealth, such that education might protect against the obesogenic effects of increased household wealth as countries develop (A. Aitsi-Selmi et al., 2014).

Another study on women in 39 low and middle-income countries showed that higher (vs lower) wealth and education groups had higher overweight prevalence across most developing countries. However, some countries show a faster growth rate in overweight in the lowest- (vs highest-) wealth and -education groups, which is indicative of an increasing burden of overweight among lower wealth and education groups in the lower-income countries (Jones-Smith, Gordon-Larsen, Siddiqi, & Popkin, 2012).

5. Physical activity is very low in the region as a whole

A major contributor to high overweight and obesity is the low level of physical activity in countries of the region. Comparative surveys consistently show that the percentages who are inactive are higher in countries of the Arab world than in other regions (see Figure 3).

Figure 3: Physical inactivity in age groups by WHO region (Hallal et al., 2012)



Low levels of physical activity are also observed among adolescents(WHO, 2005-2012).

6. Gender differences

Important gender differences have been documented in rates of overweight and obesity globally, and increases in overweight and obesity have been shown to be greater among women, and to occur at lower levels of economic development for women than for men (Monteiro, Moura, Conde, & Popkin, 2004; Wells, Marphatia, Cole, & McCoy, 2012). This is also true in countries of the Arab world (Alhyas et al., 2011; Badran & Laher, 2011; Kanter & Caballero, 2012; Musaiger & Al-Hazzaa, 2012; Musaiger et al., 2012; S. W. Ng, Zaghloul, Ali, Harrison, & Popkin, 2011; Papandreou et al., 2008).

Recent data from the Global Burden of Disease (GBD) survey 2013 support these findings showing a big gender disparity in the Arab world whereby obesity is more pronounced among women (≥20 years) than men and becoming more marked among young girls as well (IHME, 2013).

These differences reflect definitions of gender roles, whereby women are generally less mobile and less autonomous than men, and encounter obstacles to physical activity (Musaiger, 2013; Musaiger et al., 2013). In addition, they may indicate food preferences and gendered patterns of eating, whereby girls may eat more sweets and have fewer days of breakfast, more snacking, and lower consumption of milk, meat, chicken, and soda drinks than boys (Al-Haifi et al., 2013; Al Sabbah, Vereecken, Abdeen, Coats, & Maes, 2009; Allafi et al., 2014; bin Zaal, Musaiger, & D'Souza, 2009; Chakar & Salameh, 2006). They may also stem from notions of ideal weight where recent surveys have reported on divergent views of ideal bodies (Jafri, Jabari, Dahhak, Saile, & Derouiche, 2013; Musaiger, 2013; Rguibi & Belahsen, 2006), on gender differences in body size preferences (Musaiger et al., 2013), on dissatisfaction, dieting behaviors and disordered eating among young women (Afifi-Soweid, Najem Kteily, & Shediac-Rizkallah, 2002; Mehio-Sibai et al., 2003; Trainer, 2012)

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The independent effects of maternal obesity and gestational diabetes on the pregnancy outcomes

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Introduction

Obesity and gestational diabetes (GDM) in pregnancy are recognized risk factors for adverse outcomes, including caesarean section (CS), macrosomia and preeclampsia. The aim of this study was to investigate the independent effect of GDM and obesity on the adverse pregnancy outcomes at term.

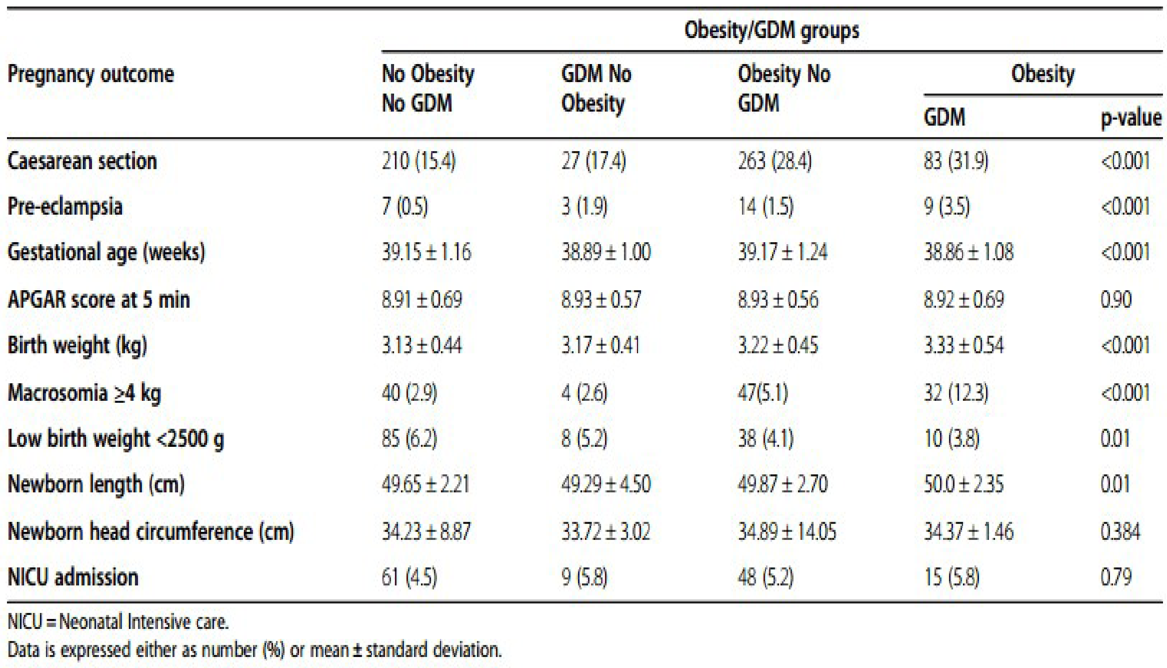
Methods

A retrospective cohort of postpartum women, in King Khalid University Hospital, were stratified according to body mass index (obese ≥30 kg/m2, non-obese <30 kg/m2) and the results of GDM screening into the following groups, women with no obesity and no GDM (reference group), women with no obesity but with GDM, women with obesity but no GDM and women with both GDM and obesity. Adverse pregnancy outcomes included high birth weight, macrosomia, CS delivery and preeclampsia. Multiple logistic regression used to examine independent associations of GDM and obesity with macrosomia and CS.

Results

2701 women were included, 44% of them were obese and 15% had GDM. 63% of the women with GDM were obese. There was significant increase in the percentage of macrosomia, $P<0.001$, high birth weight, $P<0.001$, CS, $P<0.001$ and preeclampsia, $P<0.001$ in women with GDM and obesity compared to the reference group. Obesity increased the estimated risk of CS delivery, odds ratio (OR) 2.16, confidence intervals (CI) 1.74-2.67. The combination of GDM and obesity increased the risk of macrosomia OR 3.45, CI 2.05-5.81 and the risk of CS delivery OR 2.26, CI 1.65-3.11.

Table 1: The independent effects of maternal obesity and gestational diabetes on the pregnancy outcome.



	Obesity/GDM groups				
Pregnancy outcome	No Obesity No GDM	GDM No Obesity	Obesity No GDM	Obesity	
				GDM	p-value
Caesarean section	210 (15.4)	27 (17.4)	263 (28.4)	83 (31.9)	<0.001
Pre-eclampsia	7 (0.5)	3 (1.9)	14 (1.5)	9 (3.5)	<0.001
Gestational age (weeks)	39.15 ± 1.16	38.89 ± 1.00	39.17 ± 1.24	38.86 ± 1.08	<0.001
APGAR score at 5 min	8.91 ± 0.69	8.93 ± 0.57	8.93 ± 0.56	8.92 ± 0.69	0.90
Birth weight (kg)	3.13 ± 0.44	3.17 ± 0.41	3.22 ± 0.45	3.33 ± 0.54	<0.001
Macrosomia ≥4 kg	40 (2.9)	4 (2.6)	47(5.1)	32 (12.3)	<0.001
Low birth weight <2500 g	85 (6.2)	8 (5.2)	38 (4.1)	10 (3.8)	0.01
Newborn length (cm)	49.65 ± 2.21	49.29 ± 4.50	49.87 ± 2.70	50.0 ± 2.35	0.01
Newborn head circumference (cm)	34.23 ± 8.87	33.72 ± 3.02	34.89 ± 14.05	34.37 ± 1.46	0.384
NICU admission	61 (4.5)	9 (5.8)	48 (5.2)	15 (5.8)	0.79

NICU = Neonatal Intensive care.
Data is expressed either as number (%) or mean ± standard deviation.

Discussion

The results of this study showed that GDM and maternal obesity were independently associated with adverse pregnancy outcomes. The findings confirmed that the combination of both GDM and obesity had greater impact on macrosomia and CS delivery than either obesity or GDM alone. In addition there was a noticeable trend of increment in maternal and neonatal adverse outcomes in mothers with obesity alone compared to those with GDM alone. The greater impact of maternal obesity on the adverse pregnancy outcomes has

been reported by other investigators (1). In this study we found an independent association between the frequency of CS delivery and maternal obesity with twofold increase in the estimated risk for CS delivery for obese women compared to the reference group. This finding is relevant considering the increasing rate of CS delivery (2) and obesity in many of the middle and high income countries (3,4), taking into account the significant morbidities in obese women who deliver by CS such as wound infection, endometritis, urinary tract infection and prolonged postpartum hospitalization (5).

Conclusion

Maternal obesity and GDM were independently associated with adverse pregnancy outcomes. The combination of both conditions further increase the risk.

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Obesity and adverse pregnancy outcomes: results from Riyadh Birth Cohort study

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Introduction

Obesity is proven to have detrimental effect on the pregnancy outcomes. The current study is a sub-analysis from the prospective cohort study, Riyadh Birth Cohort, which investigated the prevalence and the outcomes of pregnancies complicated with pre-gestational and gestational diabetes among other complications of pregnancy, in Saudi pregnant women.

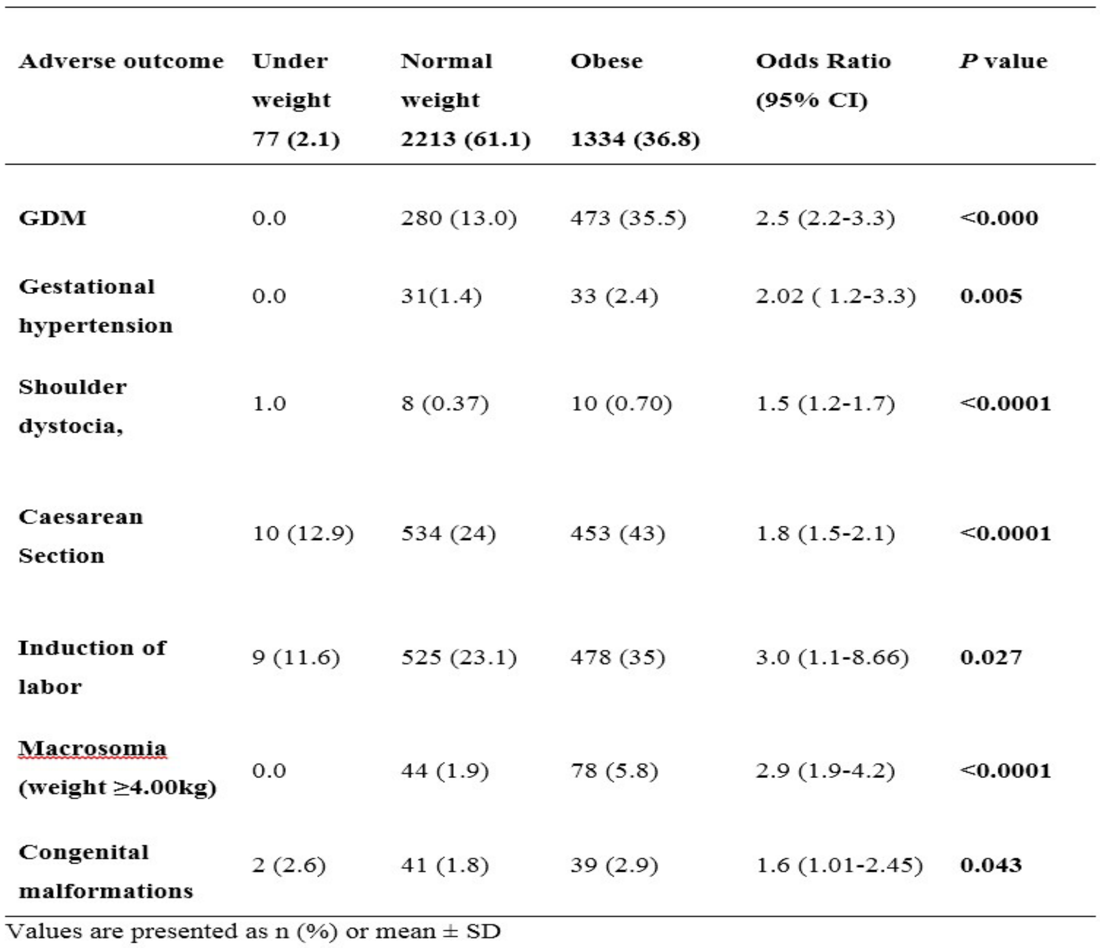
Methods

Women with recorded pre-pregnancy weight were divided into four subgroups based on their body mass index (BMI) (underweight, normal weight, overweight and obese) according to the WHO classification and the outcomes of obese and overweight women were compared to the outcomes of normal weight women. Obstetrical outcomes of interest including gestational diabetes, gestational hypertension, induction of labour, mode of delivery, shoulder dystocia and macrosomia were compared.

Results

Data were collected from 3624 subjects with available pre-pregnancy BMI. 77 (2.1%) subject were underweight (BMI <18.5), 2213 (61.1%) were of normal weight (BMI 18.5-24) and 1334 (36.4%) subject were either overweight or obese (BMI ≥24.1). Compared to the normal weight women those who were overweight or obese had increased risk of gestational diabetes, (odds ratio (OR), 2.5; 95% confidence interval (CI) 2.2-3.3; P<0.0001), gestational hypertension, OR 2.02; 95% CI 1.2-3.3; P=0.005, induction of labour, OR 1.5; 95% CI 1.2-1.7; P<0.0001, caesarean section delivery, OR 1.8; 95% CI 1.5-2.1; P<0.0001, shoulder dystocia, OR 3.; 95% CI 1.1-8.66; P=0.027, congenital anomalies, OR 1.6 95% CI 1.01-2.45; P=0.043, and delivery of a macrosomic baby (weight ≥4.00kg), OR 2.9, 95% CI 1.9-4.2; P<0.0001.

Table 1: Maternal Body Mass Index and Pregnancy Outcome



Adverse outcome	Under weight 77 (2.1)	Normal weight 2213 (61.1)	Obese 1334 (36.8)	Odds Ratio (95% CI)	*P* value
GDM	0.0	280 (13.0)	473 (35.5)	2.5 (2.2-3.3)	**<0.000**
Gestational hypertension	0.0	31(1.4)	33 (2.4)	2.02 (1.2-3.3)	**0.005**
Shoulder dystocia,	1.0	8 (0.37)	10 (0.70)	1.5 (1.2-1.7)	**<0.0001**
Caesarean Section	10 (12.9)	534 (24)	453 (43)	1.8 (1.5-2.1)	**<0.0001**
Induction of labor	9 (11.6)	525 (23.1)	478 (35)	3.0 (1.1-8.66)	**0.027**
Macrosomia (weight ≥4.00kg)	0.0	44 (1.9)	78 (5.8)	2.9 (1.9-4.2)	**<0.0001**
Congenital malformations	2 (2.6)	41 (1.8)	39 (2.9)	1.6 (1.01-2.45)	**0.043**

Values are presented as n (%) or mean ± SD

Discussion

The results of this study showed that the prevalence of obesity and overweight among pregnant Saudi women is approaching 40% which is an alarming figure considering the increased trend of frequency of adverse pregnancy outcomes noticed with increase in maternal BMI (table).

The following we believe are implication to practice in view of the results of this study;

1. Due to the high prevalence of obesity and overweight among the Saudi obstetrics population evidence based interventions such as exercise and dietary counselling should be introduced.
2. Women who are obese or overweight should have their antenatal care in a high risk clinic.
3. Postpartum and in between pregnancy care, including health education programs, should be part of the continuing care for women detected during pregnancy to be obese or overweight.

Conclusion

In conclusion obese Saudi pregnant women are at increased risk of adverse pregnancy outcomes compared to normal weight women.

Walk Strong, Live Long! Increasing ambulatory physical activity in male Emirati adolescents through a school-based walking campaign

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Keywords: *Adolescent, Arabs, physical activity, school health services, United Arab Emirates, walking.*

Abstract

Introduction

Despite the importance of increasing physical activity levels in adolescent populations, limited research on the topic has been undertaken in Arabic populations. Recent research estimates that the prevalence of adolescent obesity is over 20% in the United Arab Emirates (UAE) and that physical inactivity is one of the key vehicles driving weight gain in this population. Numerous studies have shown that adolescent weight gain paves the foundations for adult obesity and associated conditions (e.g. type II diabetes). As health behaviours are established early in life, it is important to focus on fostering and adopting physical activity habits during adolescence.

Objectives

Evaluate the efficacy of a school-based walking campaign to increase ambulatory physical activity and enhance awareness of the health benefits of walking in male Emirati adolescents.

Methods

Following ethical approval, 746 male students (age 16.2 ± 1.6 years) attending a weekday residential school in the UAE participated in a four-week walking campaign. The walking campaign utilised a multi-pronged educational program (Arabic-English) to raise awareness about the health benefits of walking that included positioning posters and leaflets in prominent positions around the school building, canteen and student accommodation; articles in the school newsletter; and a 45-minute lecture on the

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health benefits of walking. Students were provided with personal pedometers (Yamax Digiwalker 351, Tokyo, Japan) designed to act as a motivational feedback tool and environmental cue, and walking log books to record their daily step counts. School staff organised lunch- and evening-time walking clubs to promote ambulatory physical activity during school break periods. To assess the efficacy of the walking campaign on increasing ambulatory physical activity, 22 students wore an additional sealed pedometer for three four-day (Sunday to Wednesday) monitoring periods: before the campaign (Pre-Campaign), mid-point of the campaign (Mid-Campaign), and two weeks after the campaign (Post-Campaign). A random sample of students (n=66) completed a post-campaign review questionnaire assessing students' awareness of the health benefits of walking.

Results

Compared to baseline ambulatory physical activity levels (11215 ± 2415 steps/day), mean (± SD) daily step count significantly increased Post-Campaign (15039 ± 7014 steps/day; $P \leq .05$), but not Mid-Campaign (12045 ± 3669 steps/day; $P \leq .05$). Nearly three-quarters (73%) of students reported that the walking campaign increased their awareness of the health benefits of walking and 70% reported that the walking campaign increased their motivation to become more physically active. Sixty-four percent of students reported that the walking campaign increased their daily step count and level of physical activity.

Conclusions

Study findings suggest that a multi-pronged educational campaign coupled with the provision of pedometers offers a practical approach to increasing daily ambulatory physical activity in school-based male adolescents. To our knowledge, the 'Walk Strong, Live Long' Campaign is the first school-based multi-pronged walking intervention in the UAE. Future studies may want to explore the efficacy of similar school-based walking interventions on improving anthropometric indices, cardiovascular fitness, and chronic disease biomarkers in Arabic adolescent populations.

Introduction

Formed in 1971, the United Arab Emirates (UAE) is a country composed of seven emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah and Umm Al-Quwain) located in the southeast of the Arabian Peninsula.[1,2] The UAE has experienced remarkable economic and industrial growth during the past 43 years.[3] Consequently, the Emirati population have experienced a significant increase in affluence and a concomitant shift from a traditional semi-nomadic lifestyle to a modern, urbanised and technology-driven lifestyle characterised by reduced occupational, domestic and leisure-time physical activity coupled with the overconsumption of energy-dense convenience foods with poor nutritional content.[4] Accordingly, there has been a dramatic increase in the prevalence of obesity, diabetes and cardiovascular disease in adults of all age groups. Indeed, the UAE has one of the highest age-standardized death rates for cardiovascular disease in the world i.e. 308.9 per 100,000 for males and 203.9 per 100,000 for females.[4] Recent proportionate mortality statistics for the emirate of Abu Dhabi in 2013 revealed that more than a third (37%) of all deaths were due to cardiovascular disease.[5] Unless there are major changes in behavioural and metabolic risk factors at a population level (particularly amongst adolescents), then the cardiovascular disease mortality rates are set to increase further as the youthful population ages. Alarming evidence suggests that 30-40% of adolescents within the UAE are overweight or obese.[6,7] Underlying these body size concerns are findings from the World Health Organisation reporting that only 20% of Emirati school children meet daily physical activity guidelines and only 50% are taught the benefits of healthy eating.[8] Consequently, school-based health interventions targeting the adoption and maintenance of healthy lifestyle habits that have the potential to improve the overall health and wellbeing of adolescents are worthy of consideration.

Objectives

Evaluate the feasibility and efficacy of a multifaceted, culturally appropriate school-based walking campaign to increase ambulatory physical activity and enhance awareness of the health benefits of walking in male Emirati adolescents.

Methods

Study Design

Whole-school multi-component health intervention from September 2008 (start of school year) to June 2012 (end of school year). This paper reports on a four-week (February to March 2009) multi-pronged walking intervention nested within the main study that utilised a non-experimental pre-test post-test design.

Study Setting and Sample

Participants described in this article are from a cohort of male Emirati adolescents (n=746; age 16.2 ± 1.6 years) that attended a weekday residential school in the city of Al Ain, Abu Dhabi, UAE. The school was funded by the Federal Government to improve the health, physical fitness and wellbeing of adolescent UAE Nationals attending the school. Briefly, all students participated in, or were exposed to, a range of health interventions and initiatives. These included: a classroom-based health education syllabus (five lessons per 12 week term); health campaigns (two per term; see [9] for hydration example); individual and group dietetic clinics dietetic clinics for 'priority students' (underweight, overweight and obese); canteen traffic light food labelling; physical training programmes (see [10] for more information); physical rehabilitation for injured students. This multi-component health programme was delivered throughout the nine month academic year, and withdrawn over the three month summer break. All participants provided written informed consent, and ethical clearance was granted by the Al Ain Medical District's Human Research Ethics Committee in the United Arab Emirates.

Walking Intervention

Educational Component and Walking Clubs

The walking campaign utilised a multi-pronged educational program (Arabic-English) to raise awareness about the health benefits of walking that included positioning posters and leaflets in prominent positions around the school building, canteen and student accommodation; articles in the school newsletter; and a 45-minute lecture on the health benefits of walking. School staff organised lunch- and evening-time walking clubs (25-40 min at a typical walking rate of 4 km/h) to promote ambulatory physical activity during school break periods.

Pedometer and Log Books

A pedometer is a small lightweight electronic motion sensor which responds to vertical accelerations of the human body during ambulatory activities such as walking or running. Pedometers provide a valid and reliable, objective measure of ambulatory activity in children (>5 years) and adolescents.[11] As such, all students were provided with personal pedometers (Yamax Digiwalker 351, Tokyo, Japan), as well as a walking log book to record their daily school day step counts from waking to sleep for five days (Sunday to Thursday) during each week of the programme. Thursday was a half-day at the residential school with students transported back to their parents' homes across the seven emirates at midday. Therefore, step count data was only analysed from Sunday to Wednesday. Photographic instructions showing the correct placement of the pedometer were provided to each participant, each of whom was carefully instructed to wear the pedometer on the waistband in the midline of the right thigh for the whole of the working day. Pedometers were utilised for three main purposes: (i) provide quantitative real-time feedback to participants on ambulatory physical activity; (ii) act as a motivational tool and environmental prompt to be physically active; and (iii) to objectively evaluate changes in physical activity in a sub-group of students (n=22).

The present study utilised the Yamax Digiwalker SW-700 (Yamax Corporation, Tokyo, Japan) which, when compared to 15 other models of pedometer, has been found to be one of the most accurate (correctly counting the number of steps and estimating distance walked), reliable (high inter-instrument agreement), and sensitive electronic pedometers currently commercially available, both in controlled and free-living conditions in populations ranging from 7 to 74 years.[12-20] In addition, Swartz and colleagues[21] found that step count accuracy/distance estimation did not differ across a wide range of body mass index values and in a controlled shake test, the Yamax Digiwalker exhibited less than 3% error, confirming the quality criterion for technical accuracy applied by its manufacturer. [22] All pedometers were checked for accuracy using a standard 100-step test prior to dissemination to study participants.

Outcome Measures

To assess the efficacy of the walking campaign on increasing ambulatory physical activity, 22 randomly selected students wore an additional sealed pedometer for three four-day (Sunday to Wednesday) monitoring periods: before the campaign (Pre-Campaign), mid-point of the campaign (Mid-Campaign), and two weeks after the campaign (Post-Campaign). In addition, a random sample of students (n=66) completed a post-campaign review questionnaire assessing students' awareness of the health benefits of walking.

Data Treatment and Analysis

Tudor-Locke et al.[23] proposed that a minimum of three days (including at least one weekend day) of pedometer data is required to estimate free-living physical activity in a seven-day week. However, the present study was investigating the efficacy of a school-based walking campaign on increasing ambulatory physical activity in adolescents during the school week. Therefore, programme completers were defined as students that recorded at least three days of pedometer-derived step counts per school week (five days). Missing step data was recovered by adopting the individual information-centred method for handling missing pedometer data proposed by Kang and colleagues[24] which utilises an individual's average based on the mean of the remaining days of the observation period (school week in the present study). The individual information-centred approach was favoured over the group information-centred approach which is the most common recovery method and utilises a mean from the sample to replace an individual's missing value.[25] The group information-centred approach is not appropriate when repeated measures are used (i.e. multiple days of data collection) on the same experimental unit (e.g. an individual) as it may bias the results (Laird 1998);[26] rather, replacements based on intra-individual information generate a more accurate recovery of the missing data because intra-individual variability is lower than inter-individual variability.[23,24]

Using subjects as their own controls (non-experimental pre-test post-test design); physical activity (pedometer-determined steps per day) was compared before and at the end of the three-week intervention using a repeated measures ANOVA. All analyses were conducted using IBM SPSS Statistics software (version 19; SPSS Inc., Chicago, IL, USA) and the alpha level was set at .05.

Results

Source population and study sample characteristics are presented in Table 1.

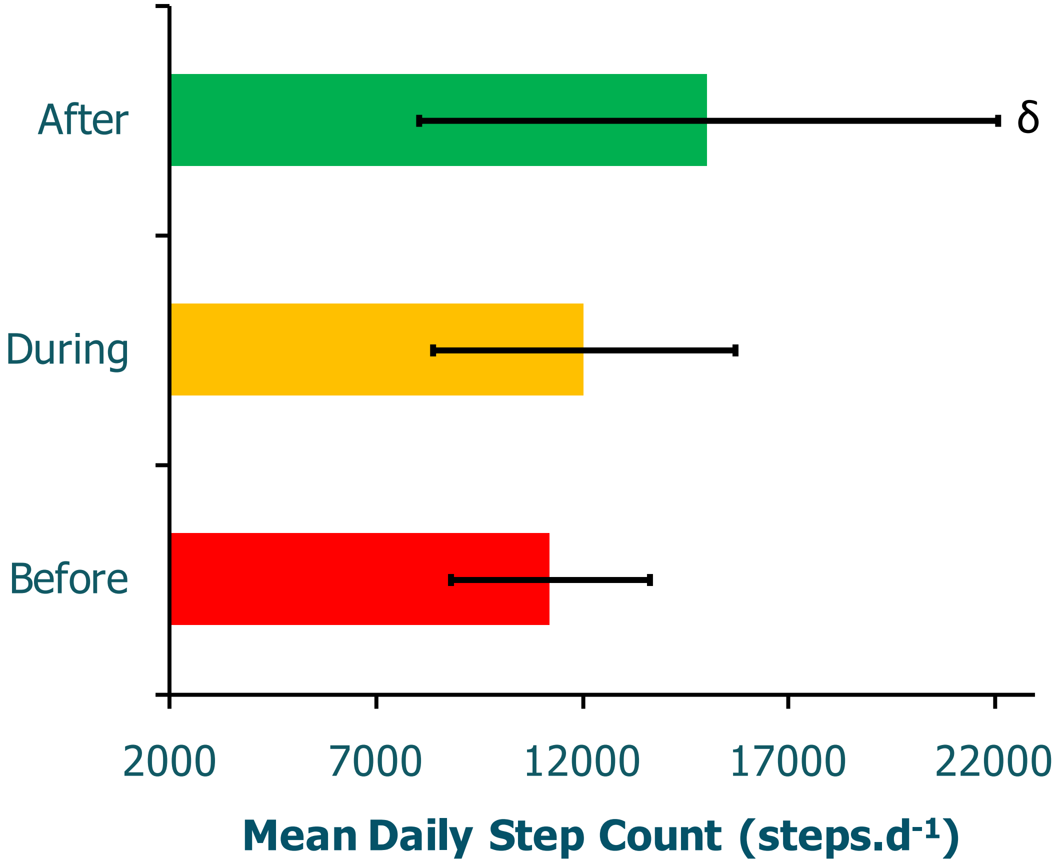
Table 1. Body size and physical fitness data for all school students and the walking campaign research group February 2009

	Whole School February 2009			**Walking Campaign Research Group February 2009**		
	n*	**Mean**	**SD**	**n**	**Mean**	**SD**
Height (cm)	720	**169.6**	6.7	22	**169.8**	5.2
Body Mass (kg)	720	**68.8**	17.0	22	**67.9**	14.6
BMI (kg·m^2)	720	**23.5**	5.4	22	**23.5**	4.7
WC (cm)	720	**77.8**	13.0	22	**76.5**	12.4
WHTR	720	**0.46**	0.07	22	**0.45**	0.07
One-mile run time (min:s)	730	**08:37**	02:07	22	**08:12**	02:10
Push-ups (reps·min^{-1})	728	**26**	14	22	**29**	16
Sit-ups (reps·min^{-1})	730	**39**	9	22	**38**	10

Note. BMI = Body mass index, SD = Standard deviation, WC = Waist circumference, WHTR = Waist-to-height ratio. WHTR ≥ 0.5 indicates increased risk for cardiovascular and metabolic complications. *Data represents students not absent from school or injured during anthropometric and/or physical fitness assessment periods.

Compared to baseline ambulatory physical activity levels (11215 ± 2415 steps/day), mean (± SD) daily step count significantly increased Post-Campaign (15039 ± 7014 steps/day; *P*≤.05), but not Mid-Campaign (12045 ± 3669 steps/day; *P*>.05; see Figure 1). Nearly three-quarters (73%) of students reported that the walking campaign increased their awareness of the health benefits of walking and 70% reported that the walking campaign increased their motivation to become more physically active. Sixty-four percent of students reported that the walking campaign increased their daily step count and level of physical activity.

Figure 1. Daily step counts (mean ± 1 SD) before, during and after the walking campaign (δsignificantly different from 'Before'; P<.05).



Discussion

The main finding of the study was that a multi-pronged educational campaign coupled with the provision of pedometers offers a practical approach to increasing daily ambulatory physical activity in school-based male adolescents. Previous research concluded that male students failing to achieve 15000 steps·d^{-1} were more likely to be overweight/obese compared to male students exceeding 15000 steps·d^{-1} (Tudor-Locke et al., 2004).[27] The results of the current study demonstrates that it is possible for male UAE adolescents attending a week-day residential school to accrue an average of 15000 steps per day during waking hours. Furthermore, this relatively simple and resource-minimal walking intervention was effective in raising students' walking physical activity from sub-optimal levels (i.e. < 15000 steps.d^{-1}) to levels better associated with health benefits.

To our knowledge, the 'Walk Strong, Live Long' Campaign is the first school-based multi-pronged walking intervention in the UAE. A pedometer offers a practical, while cost-effective approach to increasing daily physical activity in school-aged adolescents. Schools are important arenas for health promotion and teachers should be encouraged to create active environments in an attempt to enhance student health and wellbeing. Future studies may want to explore the efficacy of similar school-based walking interventions on improving anthropometric indices, cardiovascular fitness, and chronic disease biomarkers in Arabic adolescent populations.

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Clinical Audit on the provision of Diabetes Care in the Primary Care Setting by United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA)

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Abstract

Objective

United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) provides primary health care services including care for diabetes and hypertension, with limited resources under difficult circumstances in Gaza, West Bank, Jordan, Lebanon and Syria. A total of 114,911 people with diabetes were registered with UNRWA health centres in 2011. The aim of this cross sectional observational study was to assess the quality of diabetes care in the UNRWA primary health care centres

Method

The study population consisted of 1,600 people with diabetes attending the 32 largest UNRWA health centres and treated there for at least one year. Between April and Sept 2012 data from medical records, including results of clinical examinations and laboratory tests done performed last year, current management including self-care education and evidence of diabetes complications were collected and recorded in a previously validated data collection form (DCF). Patients were interviewed and clinically examined on the day of the audit and blood collected for HbA1c testing which was done at a central lab using High-performance liquid chromatography (HPLC) method (HLC®-723G8 Tosoh Corporation, Japan. Data was transferred from paper records into a computer and analysed with Epi-info 2000.

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Results

Type 1 diabetes was seen in 4.3% and type 2 in 95.7%. Co-morbid hypertension was present in 68.5%; 90.3% were either obese (64.0%) or overweight (26.3%). Clinical management of diabetes was largely in line with UNRWA's technical instructions (TI) for diabetes. Records for 2 hour postprandial glucose (2h PPG), serum cholesterol, serum creatinine, and urine protein analysis were available in 94.7%, 96.4%, 91.4% and 87.5%,- cases, respectively. Records of annual fundoscopic eye examination were available in 47.3% cases but foot examinations were less well documented. Most patients (95.6%) were on anti-diabetic drugs - 68.2% oral anti diabetic drugs (OAD) only, 14.4% combination of OAD and insulin, and 12.9% insulin only. While 44.8% patients had 2h PPG ≤ 180mg/dl, only 28.2% had HbA1c ≤ 7%; 55.5% and 28.2% had BP ≤140/90 and ≤130/80 mm of Hg respectively. Serum cholesterol ≥200 mg/dl, serum creatinine ≥1.2mg/dl and macro albuminuria were noted in 39.8%; 6.4% and 10.3% cases respectively. Peripheral neuropathy (52.6%), foot infections (17%), diabetic retinopathy (11 %) and myocardial infarction (9.6%) were the most common long term complications. One or more episodes of hypoglycaemia were reported by 25% cases in total and in 48% of those using insulin. 17.7% and 22.6% cases received no or ≥4 self-care education sessions respectively.

Conclusion

The study confirmed that UNRWA doctors and nurses follow TI for diabetes and hypertension fairly well. Financial constraints and the consequent effects on UNRWA TI and policies related to diabetes care were important constraints. Key challenges were; reliance on 2h PPG to measure control; non-availability of routine HbA1c testing, self-monitoring of blood glucose (SMBG) and statins within the UNRWA system; and high levels of obesity in the community. Addressing these will further strengthen UNRWA health system's efforts of providing services for diabetes and hypertension at the primary care level.

Introduction

UNRWA has worked in the Near East for 64 years, providing health, education and social services for over 5 million Palestine refugees in Jordan, Lebanon, Syria, the West Bank and Gaza Strip. Due to the prevailing socioeconomic conditions, psychological stress and lack of access to healthy food and physical activities, non-communicable diseases (NCDs) such as, diabetes (DM), hypertension (HT), coronary artery disease (CAD) and cerebrovascular disease (CVD) are major problems for Palestine refugees The number of patients registered with DM has increased progressively and doubled in the last decade reaching 108,000 patients in 2012, without the data from Syria [1]. The exact prevalence of diabetes among Palestine refugees is not known, but may be assumed to be similar to the general population of the countries where they live, [2] i.e., 10.1% in Jordan, 7.8% in Lebanon, 8.6% in Palestine and 10.8% in Syria [3]; hence, likely to be between 8 and 11 % among adults 20-79 years of age. Around 11.0% of people ≥40 years attending UNRWA health facilities have DM [1].

UNRWA has provided care for DM and HT at their primary health care centres since 1992 and the NCD strategy has been revised four times with the latest revision in 2009.[4] The current strategy is structured around three main elements - healthy life style promotion emphasizes the importance of weight control and regular exercise; early detection of diabetes by active screening of at risk individuals; and treatment protocols and effective case management with dietary management, physical exercise and risk assessment and screening for cardiovascular, cerebrovascular and peripheral vascular disease to prevent secondary complications. Another important element of the strategy is to improve record keeping, program effectiveness and quality of services. UNRWA has started to roll out an E-health initiative which allows periodic cohort monitoring and evaluation. [5, 6, 7, 8] To improve care delivery, periodic assessment of knowledge, attitudes and practices of care providers using validated questionnaires and data collection tools supplemented with clinical audit. [9-14], the aim of this cross sectional observational study was to assess the quality of diabetes care in the UNRWA primary care centres. In addition the study also assessed the UNRWA medical officers' ability to deliver DM care by evaluating their knowledge, attitude and practice regarding patients and services, which will be presented in another paper.

Methods

Study design

Cross-sectional prospective survey of patients with DM.

Setting

The study was conducted in the 32 largest PHCs, with 8 in the following locations Gaza, Jordan, Lebanon and the West Bank. Syria was not included due to the on-going armed conflict. In 2012, UNRWA had 116 PHC clinics in these four Fields serving a population of 3,134,732 refugees. Each clinic is staffed by 2 to 6 doctors and a variable number of nurses. All screening, diagnosis and treatment services at the clinic are provided free-of-charge.

Palestine refugees who attend the clinics are screened for DM if they are ≥40 years old, at risk of non-communicable diseases, or pregnant or planning to get pregnant. Blood glucose tests are done by laboratory technicians and diagnosis is confirmed by medical officers if the fasting blood glucose (FBG) is ≥ 126 mg/dl on 2 separate occasions. [4, 15] If the readings are between 100-125 mg/dl, a 75g oral glucose tolerance test (OGTT) is performed to confirm or exclude diabetes. If FBG results are ≤ 100 mg/dl the patient is checked again in the following year. In the absence of facilities for testing for autoimmune markers for type 1 diabetes, children and young adults presenting with classical symptoms of diabetes – rapid loss of body weight with polyphagia, polyuria and polyhydria with or without ketonuria in the presence of random blood glucose ≥ 200 mg/dl or fasting glucose ≥126 mg/dl and requiring insulin treatment to control hyperglycemia are classified as type 1 DM. Persons diagnosed with DM are clinically assessed for co-morbidities and complications and these data along with demographic and clinical information are recorded in either patient registration files (hard copy) or in the E-Health system in health centres implementing electronic medical records. At registration, information on risk factors such as smoking, alcohol intake, physical activity and obesity (defined as body mass index ≥30 kg/m^2) are recorded.

Patients are managed according to a standard algorithm defined in the UNRWA TI, [4] with diet and lifestyle advice and different classes of anti-diabetic drugs that include OADs namely Glibenclamide, Gliclazide and Metformin and Insulin injections. Patients with uncontrolled DM are seen weekly, fortnightly or monthly until their 2h PPG value is ≤180 mg/dl and subsequently followed every 3 months. Once a year all DM patients undergo blood tests for total serum cholesterol and creatinine, urine examination for macro-proteinuria and dilated fundoscopic eye examination During quarterly visits, weight, blood pressure (BP), PPG value, as well as presence of complications (defined as blindness, end-stage renal failure, myocardial infarction (MI), congestive cardiac failure, stroke, and above-ankle amputation) are recorded.

Patient population, sampling method and size

There were 114,911 DM patients receiving care in UNRWA health centres at the end of 2011.[16] A sample size of 1,600 patients (50 from each selected health centre namely 400 from each field) i.e., 14% of the total diabetes population in the UNRWA health system which was considered sufficient to provide a representative sample. The first fifty consecutive patients visiting the selected clinic on assessment days with confirmed DM and receiving care at the same UNRWA NCD clinic for at least one year, were included in the study after they gave a written informed consent. Recruitment at the clinic was stopped on reaching the target of 50 patients.

Source of data, variables, reporting formats and analysis

Patient data were obtained from paper and/ or E-Health records and through direct interviews and recorded on the pre-tested DCF [9, 10] modified slightly to accommodate UNRWA TI and procedures. Variables included in the DCF were DM type, risk factors, weight/height/waist measurements, blood pressure, and prior year's medical records including documented lab tests, complications, information on self-monitoring, health education and current medication.

The DCF was completed in the patient's presence. To remove bias and ensure consistency across the study sites all patients were interviewed and clinically examined by staff responsible for NCD care at UNRWA Headquarters and field offices: Chief of Disease Prevention and Control and the Field Disease Control Officer, respectively . A local staff nurse or a trained NCD nurse assisted with the examination, and the local laboratory technician withdrew blood samples and facilitated the transportation for HbA1c testing at a non UNRWA central lab at the Augusta Victoria Hospital in East Jerusalem. HbA1c test was done using the

High-performance liquid chromatography (HPLC) method (HLC®-723G8 Tosoh Corporation, Japan). Data were transferred into a computer and analysed with Epi-info 2000.

Ethics approval

Approval for the study was obtained from UNRWA Headquarters and the four Fields. Patients gave written consent for participation in the study.

Results

The characteristics of the 1,600 patients included in the audit are shown in **Table 1**. The mean age (SD) of the patients was 56.6 (12.6) years, ranging between 2 to 90 years. 37.5% patients with type 2 diabetes were < 55 years. Two thirds of the entire patients were female (63.8%), which is in line with the gender distribution of patients attending UNRWA health centres (63.7%). Duration of DM treatment was used as a surrogate marker for DM duration and it varied considerably, ranging from 1-30 years, with a mean (SD) duration of 7.2 (4.9) years. People with type 1 DM (8.1 (4.9) years and type 2 DM with hypertension 7.8 (5.0) years) had longer treatment duration compared to type 2 DM without hypertension (5.9 (4.3) years).

Type 1 DM was seen in 68 (4.2%) cases, with a slight excess of females - 37 to 31 males. Due to the selection criteria no case of gestational DM was included. Co-morbid hypertension was seen in 1,102 (68.9%), all of them with type 2 DM. This data is similar to that seen in the entire UNRWA health system DM cohort in 2011.

Being overweight or obese was common in the study population, the mean (SD) BMI was 32.1 (6.4). Overall 90.3% were either overweight (26.3%) or obese (64.0%). Obesity was more common among women - 73.1% compared to 47.9% among men**.** Smoking was more prevalent among men (34.1%) than women (11.3%). Few patients gave history of alcohol consumption.

In terms of record keeping and monitoring, data on age, gender, BMI, type of DM, duration and type of DM treatment, frequency and topic of health education sessions, and information on self-monitoring were available in all 1600 cases. Records of 2h PPG, fasting serum cholesterol, serum creatinine and urine protein values in the previous one year were available in 94.7%, 96.4%, 91.4% and 87.5% cases respectively.

The most common treatment was OAD; 68.2% (1091) and 14.4% (231) were receiving OADs alone or in combination with insulin respectively. Insulin alone was used in 12.9% (207) cases and non-pharmacological lifestyle treatment (diet and exercise) alone in 3.9% (63) cases. Eight cases while attending the UNRWA health system were receiving treatment from outside. Of the 1322 cases on OADs, 89.3% (1181), 46.5% (615) and 18% (238) were receiving metformin, glibenclamide, and gliclazide alone or in combination respectively. Among subjects on insulin 72.5% were receiving < 60 IU/day and 77.8% were self-injecting. SMBG was reported by 32.6% of all and 66.2 % with type 1 DM.

The mean (SD) 2h PPG value for 1,515 cases where information was available was 200.2 (74.5) mg/dl, with the range from 65 to 632 mg/dl. **Table 2a & 2b** show glycaemic control in relation to type of DM and type of treatment. In 44.4% cases the last recorded 2h PPG was ≤ 180 mg/dl. The proportion of cases with acceptable control was similar for different types of DM and was highest among those on non-pharmacological treatment (81%), followed by those on OAD alone (47.9%); OAD in combination with insulin (31.6%) and insulin alone (30.9%) – a reflection of disease duration and severity.

The mean (SD) HbA1c was 8.3% (1.9).Using an HbA1c with cut off value of 7.0 % as adequate control, only 27.9% cases were found to be under control, much lower than the 44.4% indicated by the last measured 2h PPG value. When comparing results of HbA1c test with the last measured 2h PPG values it was noted that while 86% of subjects with 2h PPG ≥180 mg/dl had HbA1c values ≥7%, 56% of subjects with 2h PPG ≤180 mg/dl also had HbA1c values ≥7%.

Results for serum cholesterol estimations were available in 96.4% (1,543) cases; the mean fasting value (SD) was 191.8 (49.1) mg %. Hypercholesterolemia (≥ 200 mg %) was seen in 39.8% (614) cases. Results of serum creatinine test were available for 91.4% (1,534) cases. The mean (SD) value was 0.865 (0.44) mg %. Elevated creatinine (≥ 1.2 mg %) was seen in 6.4% of all cases, 4.9% of type 1 DM cases, and 3.7% of Type 2 DM cases without hypertension but was twice as frequent in cases with hypertension - 7.5%. Urinary protein (macro albuminuria) estimation was done in 87.5% cases and was found raised in 10.3% cases.

Fundoscopy results were available for 757 cases (47.3%). UNRWA ophthalmologists had examined 408 (53.9%) and ophthalmologists from outside UNRWA had examined the remaining 349 (46.1%). There were 83 (11%) cases of retinopathy amongst those who had undergone fundoscopy.

The results of annual foot examination are shown in **table 3**. Peripheral neuropathy was documented in 52.6% cases and was equally distributed among those with and without control based on the 2h PPG results. Skin infections, both mycotic and bacterial, were documented in 17% cases.

There were 204 (12.8%) patients in the study population with late complications, 186 had one and 18 had two complications. No case had more than two late complications. Details of late complications are shown in **table 4.**

Discussion

The clinical audit of the UNRWA Non Communicable Disease (NCD) Care Programme, with a focus on diabetes care validated the general UNRWA approach to health service delivery and confirmed its capacity to manage diabetes care in a primary health care setting. At the same time, it conducted an in depth assessment of protocols, procedures and performance in NCD care, documenting in particular the strengths of UNRWA diabetes care and more importantly, highlighting some critical shortcomings that will help define priorities for further improvement.

The clinical audit confirmed that UNRWA medical providers working in diabetes care generally follow the TI rigorously. In terms of record keeping and monitoring, data on most parameters were available in over 90% cases including records of lab tests and clinical examinations performed in the last one year which is better than in similar studies done in other developing countries in tertiary care centres, albeit some years ago. [10, 17]

Several shortcomings were identified some of which relate to financial constraints and the consequent effects on UNRWA TI and policy related to diabetes care. Only 45% of people with diabetes had 2h PPG values within acceptable control (≤180 mg/dl) as defined by UNRWA TI. The control based on HbA1c testing (≤7.0%) was even lower at 28%, with the lowest control found in patients receiving insulin treatment (7.4%) and this is a cause of concern. Relying on 2h PPG done only during clinic visit could be misleading. Non availability of HbA1c tests to monitor control due to cost constraints means that UNRWA has systematically overestimated its quality of DM control.

Comorbid hypertension was present in 69% (1102) cases and all of them were receiving antihypertensive medications. UNRWA TI defines blood pressure ≤140/90 mm Hg as the control target even for people with diabetes with co morbid hypertension. This level is higher than currently recommended International Diabetes Federation (IDF) and American Diabetic Association (ADA) target of ≤130/80 mm Hg for people with diabetes. Only 55.5% of cases with co-existing hypertension had their last recorded BP ≤140/90 mm Hg and only 28.2% had their BP ≤130/80 mm Hg. Hypertension control rates in this study are lower compared to the cumulative cohort data from six clinics in Jordan that use the E health record system where 87% of all patients had BP ≤140/90 mm Hg. [7] Uncontrolled hypertension in the setting of relatively poor glucose control is fertile ground for macro and microvascular complications particularly myocardial infarction, stroke, nephropathy and retinopathy. The fact that raised serum creatinine was seen twice as often in type 2 patients with co morbid hypertension and that 9.3% of cases had documented MI despite the relatively younger age, low prevalence of smoking and higher female gender mix in the study population points towards the need for more aggressive control of BP.

UNRWA TI defines the control target for total serum cholesterol at <200 mg/dl or <6.5 mmol/L. Cholesterol levels were elevated in 39.8% (614) cases. Because of financial constraints UNRWA cannot provide free treatment for hyperlipidaemia and as a consequence only half the patients (53.4%) with raised cholesterol were on lipid lowering drugs, most of them paying out of pocket. Including free supply of lipid lowering drugs, in particular, a statin and paying greater attention to lifestyle counselling will be necessary to address the risk of cardiovascular disease.

Insufficient focus on lifestyle counselling was another shortcoming identified. More than 90% of people with DM within the UNRWA system are either obese (64.0%) or overweight (26.3%). Around 70% have co existing hypertension and almost 40% have hyperlipidaemia as noted above and all these conditions are amenable to prevention through lifestyle measures; requiring greater attention to lifestyle counselling. According to UNRWA TI, patients should receive at least four health education sessions during assessment visits each year. The audit revealed that 17.6% patients received no self-care education and only 361 (22.6%)

received four or more health education sessions, reflecting poor adherence to guidelines. Less than half the patients (40.6%) recalled receiving relevant lifestyle health education sessions (exercise and diet). Although foot complication rates are significant (e.g. 53% peripheral neuropathy and 13% foot infections.), only 16% of patients recalled receiving foot care advice. The same applies for counselling on hypoglycaemia, even though 20-30% of patients were receiving insulin treatment. Better training, redefining roles and skilful deployment of non-medical health professionals may help improve self-care education and patient counselling.

The most prevalent early complication among patients was peripheral neuropathy seen in 52.6%. History of MI or undergoing angioplasty was noted in 9.3% cases and is similar to the 9.7% prevalence of MI among diabetic patients from the region reported earlier [18]. The high rate of MI reflects the need to address underlying risk factors and to strictly follow UNRWA's secondary prevention strategy for people with DM and hypertension with stricter monitoring of BP and glycaemia control using HbA1c and introducing the use of statins.

The findings of this study are almost identical to those reported from tertiary care centres in other developing countries using a similar study protocol [10, 17, 19-22]. This indicates that in general people with type 2 DM have multiple comorbid conditions – being overweight and obesity, hypertension, and dyslipidaemia. Control of hyperglycaemia, hypertension and hyperlipidaemia is less than satisfactory and complications are high. In many of these studies, the proportion of patients undergoing annual laboratory tests and examinations were much lower indicating poor adherence to protocols; level of control for glucose, blood pressure and lipids was lower and complication rates higher.

The high prevalence of overweight or obesity and other risk factors in the study population points towards a need for a more comprehensive and strategic response that goes beyond the activities of the NCD care programme alone to address such fundamental issues and the recently applied Family Health Team reform [23] offers an ideal reference framework with focus on persons and families to address early prevention of disease by addressing family and community risk factors, early detection through systematic screening and provision of comprehensive care.

While more efforts are required to raise awareness and improve lifestyles through health promotion; the prevailing socioeconomic and psychological stress from the security situation in refugee camps poses a big challenge. Limited funding and need to prioritise scarce resources also places constraints on policy recommendations.

In conclusion, UNRWA's extensive experience in DM care in primary health care settings and the capacity, experience and rigour of their medical providers are a solid foundation on which to improve DM care. This study provides a basis to guide further actions aimed at modernizing and broadening DM care and address priorities for improvement by the UNRWA Health Department.

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Conflicts of Interest

None declared

Author contributions

Anil Kapur, Yousef Shahin and Akihiro Seita designed the study and wrote the first draft which was further developed by other authors. All authors contributed to the writing of the subsequent drafts and revisions of the paper, and all authors have read and approved the final paper for submission.

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Table 1: Study Population Characteristics and Key Findings

Mean Age Years (±SD)	1600	56.6 (± 12.6)
Mean Duration of DM Treatment Years (±SD)	1600	7.2 ± 4.9
Gender		
Female	1020	63.8%
Male	580	36.2%
Type of DM		
Type 1	68	4.3%
Type 2	1532	95.7%
BMI		
Underweight (<18.5)	18	1.1%
Normal weight (18.5-24.9)	137	8.6%
Overweight (25-29.9)	421	26.3%
Obese (≥30)	1024	64.0%
Comorbid Hypertension	1102	68.9%
BP >140/90 mmHg	490	44.5%
BP >130/80 mmHg	792	71.8%
2 hr PPG result available	1515	94.7%
2 h PPG ≥ 180 mg%	799	52.7%
HbA1c tested during study	1600	100%
HbA1c ≥7.0%	1148	71.8%
S Cholesterol results available	1543	96.4%
S Cholesterol ≥200 mg%	614	39.8%
S Creatinine results available	1534	91.4%
S Creatinine >1.2mg %	98	6.4%
Proteinuria results available	1400	87.5%
Macro albuminuria +ve	144	10.3%
Fundoscopy results available	757	47.3%
Retinopathy +ve	83	11.0%

Table 2a: Glycaemic control in relation to type of DM

DM Type	**Controlled**		**Uncontrolled**		**No Data**		**Total**
	2-hr PPG (≤180 mg/dl)	HbA1c (≤7.0%)	2-hr PPG (>180 mg/dl)	HbA1c (>7.0%)	2-hr PPG	HbA1c	
Type 1	29 (42.6%)	5 (7.4%)	34 (50.0%)	63 (92.6%)	5 (7.4%)	0	68 (100%)
Type 2	183 (42.6%)	108 (25.1%)	226 (52.5%)	332 (74.9%)	21 (4.9%)	0	430(100%)
DM with HTN	504 (45.7%)	339 (30.8%)	539 (48.9%)	763 (69.2%)	59 (5.4%)	0	1102 (100%)
Total	**716 (44.8%)**	**452 (28.3%)**	**799 (49.9%)**	**1148 (71.7%)**	**85 (5.3%)**	**0**	**1,600 (100%)**

Table 2b: Glycaemic Control in relation to treatment

Treatment	**Controlled**		**Uncontrolled**		**No Data**		**Total**
	2-hr PPG (≤180 mg/dl)	HbA1c (≤7.0%)	2-hr PPG (>180 mg/dl)	HbA1c (>7.0%)	2-hr PPG	HbA1c	
Lifestyle	51 (81.0%)	55 (87.3%)	4 (6.3%)	8 (12.7%)	8 (12.7%)	0	68 (100%)
OHA only	523 (47.9%)	355 (32.5%)	516 (47.3%)	736 (67.5%)	52 (4.8%)	0	430(100%)
OHA with Insulin	73 (31.6%)	19 (8.2%)	149 (64.5%)	212 (91.8%)	9 (3.9%)	0	1102 (100%)
Insulin only	64 (30.9%)	18 (8.7%)	128 (61.8%)	189 (91.3%)	15 (7.2%)		
Total	**711 (44.4%)**	**447 (27.9%)**	**797 (49.8%)**	**1145 (71.2%)**	**92 (5.8%)***	**8 (0.5%)***	**1,600 (100%)**

*Type of treatment not known in 8 cases.

Table 3: Results of Foot Examination

Foot Condition	**Number (%)**
Peripheral neuropathy	842 (52.6%)
Fungal Skin Infection	209 (13.1%)
Bacterial Skin Infection	63 (3.9%)
Healed Ulcer / Gangrene	30 (1.9%)
Absence of Foot Pulse	8 (0.8%)
Above Ankle Amputation	6 (0.4%)

Table 4: Late Diabetes Complications

Late Complication	**Number (%)**
Myocardial Infarction	149 (9.3%)
Cerebral Stroke	34 (2.1%)
Total Blindness	23 (1.4%)
Amputation	6 (0.4%)
End Stage Renal Disease	6 (0.4%)

Exploring the Need for a Palliative Care Nurse Specialist in Oman; a Roadmap for Collaborative Care

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Abstract

Oman has witnessed great achievements in the past four decades especially in its healthcare services that has been recognized by the World Health Organizations and many other international organizations. These developments and achievements reduced the infant mortality rate and the incidence of communicable diseases in the country. With these changes, Oman has witnessed demographic and epidemiological changes in its structure leading to increased longevity and increased prevalence of non-communicable chronic diseases (MOH, 2014; MOH, 2013). This generated the need for palliative care services in the country with a major role that nurses are required to undertake.

Palliative care nurses work with individuals and their families who are suffering from a life-threatening illnesses. They work in order to improve the quality of life of these people through prevention and control of suffering; early detection and thorough assessment, diagnosis and management of pain and other problems associated with their illness whether it is physical or psychosocial or spiritual (WHO, 2015; PCNA, 2014). They provide care at multiple levels including primary, secondary and tertiary health services. They work with an interdisciplinary team in different care settings (PCNA, 2014).

This paper will explore the need for palliative care specialist nursing services in Oman. It will discuss the sporadic efforts that have been put in place in order to establish and integrate such service into the current healthcare system. It will recommend and draw a roadmap for paving the way towards an interdisciplinary collaborative palliative care service to be offered in the country for those who need it in different settings.

Introduction

The Sultanate of Oman is located in the south eastern corner of the Arabian Peninsula. It shares the borders with the Republic of Yemen, Saudi Arabia and United Arab Emirates (U.A.E.). It is about 309,500 KM2. (MOT, 2013) and has a population of around four million approximately 1.8 million of those are foreigners (NCSI, 2015). The Omani population is considered to be a young population as about 50% of the population is below the age of 21years and merely 6% of the entire population is 60 years or above (MOH, 2014). The Omani culture is an ethnically diverse culture. People of Oman speak several different languages with Arabic being the main. Islam is the main religion followed in the country and has a great influence on the culture and lifestyle of the people living in the country (Al-Zadjali et al, 2014).

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The Omani healthcare system has witnessed tremendous changes in the last 44 years. The government has taken the responsibility of providing healthcare services free of cost to all Omanis and expatriates who are working in the governmental agencies adopting a national public healthcare model. With this and the improvement in the health services provided, Oman has witnessed a noticeable decline in the infant mortality rate to 9.5/10000 of the population by the year 2012 (MOH, 2014). It also resulted in the increased life expectancy at birth to 76.6 years (Male= 74.8 and Female= 78.5) (WHO, 2014). In addition, the crude birth rate of the country is 3.2 per 1000 individuals and the crude death rate is 32.1 per 1000 individual. Considering these rates, it is thought that the Omani population will double in the next 25-30 years increasing the total population to more than 7 million by year 2050 and as the population continue aging, it is expected that almost 13% of the population will be 60 or above by the year 2050 (MOH, 2014). With increased longevity, modernization and changes in the lifestyle came the burden of non-communicable diseases. According to WHO (2014), 68% of the total deaths in Oman are caused by non-communicable diseases. Around 33% of the deaths are caused by cardiovascular diseases; 10% from Diabetes; 10% from cancer; 2% from chronic respiratory diseases and 13% from other non-communicable diseases (WHO, 2014).

Palliative Care Nursing

According to World Health Organization (WHO), “Palliative care is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual” (2015). Based on this definition palliative care nurses are the nurses who work with individuals and their families who are suffering from a life-threatening illnesses. They work in order to improve the quality of life of these people through prevention and control of suffering; early detection and thorough assessment, diagnosis and management of pain and other problems associated with their illness whether it is physical or psychosocial or spiritual. Thus, they need to possess certain specific competencies in order for them to meet the goal of the services they provide.

Competencies of Palliative Care Nurses

Based on the definition provided by WHO, palliative care nurses function to relief pain and suffering of their patients; they handle death and dying as a normal process and integrate psychological and spiritual support in their patients care plan. They support patients and their families to live a normal life and accept any distressing complication or situation as it comes. They work in collaboration with a team of other healthcare professionals in order to improve the quality of life of their patients. In functioning in these roles, they should possess some competencies that will enable them to function in these roles in wide range of settings successfully. Several societies, associations and organizations have outlined a number of competencies that a nurse should possess when functioning as a palliative care nurse. Almost all these organizations describe similar competencies as the expected outcome is the same. For example the European Association for Palliative Care (EAPC) has mentioned that the main constituents of the competencies that must be demonstrated by any healthcare professional working with palliative care should be autonomy, dignity, relationship between patient and healthcare professionals, quality of life, position towards life and death, communication, public education, multiprofessional approach and grief and bereavement (Gamondi, Larkin, & Payne, 2013). Similarly, the Canadian hospice palliative care (HPC) standards in addition to the Canadian Nurses Association’s code of ethics, it includes person and family focused care; comfort; coordination and navigation; quality and safety; leadership and person and professional growth (2014). Likewise, in Australia, the Competency Standards for Specialist Palliative Care Nursing Practice focused mainly on five main interrelated domains on which the framework was built. These standards were: therapeutic relationships; complex supportive care; collaborative practice; leadership and improving practice (2005). Thus, it is thought that the most common core competencies that a palliative care nurse should possess include: therapeutic communication; functioning in a multidisciplinary team using a multi-professional approach; applying various approaches in grief and bereavement while caring for patient and family; ability to use problem solving and critical thinking skills while assessing, treating and evaluating care delivered to the patient using best available knowledge and skills as well as striving for attaining higher levels of continuing professional development.

Towards Palliative Care Nursing in Oman

The move towards palliative care nursing in Oman started sporadically and very early. However, the care was integrated into the service and was not mentioned as a separate entity until Oman Cancer Association (OCA), the former National Association for Cancer Awareness (NACA), supported by Ministry of Health and some international partners such as Middle Eastern Cancer Consortium (MECC) and the Oncology Nursing Society (ONS) organized the first basic palliative care course for Omani nurses. This was immediately followed by an advanced training course in palliative care for nurses. This course was organized with the support from MECC, OCA, the Oncology Nursing Society (ONS), the National Cancer Institute (NCI) and the American Society of Clinical Oncology (ASCO). The advanced course was followed by a research day on palliative care in the community and an international workshop on palliative care for the geriatric oncology patient. Over 600 participants attended this conference from more than 20 different countries around the world (Silbermann & Al-Zadjali, 2013). The basic and the advanced course have trained around 90 nurses with the needed competencies to function as a palliative care nurse in their respective areas of practice. These nurses were then sent back to their institutions with an appropriate action plan to be implemented in their respective practice. Multidisciplinary teams were formed in their institutions in order to implement the action plan. The trained nurses raised public awareness and organized several continuing education activities in order to train their colleagues in their institutions.

In addition to training these nurses, the Omani Community Health Nurses were playing an active role in providing culturally oriented family centered care for their patients since 2005. This role was further strengthened by Ministry of Health's Memorandum of Agreement that was signed with Cardiff University in order to prepare Bachelor prepared community health nurses to provide community healthcare to the patient in Oman (Al-Zadjali et al., 2014). Consequently, 44 nurses graduated from this program as of the end of 2014. Part of the curriculum that is taught to these nurses is Palliative Care preparing them to take an active role in promoting the quality of life of patients who needs palliative care in different community settings.

The move towards palliative care did not stop with just preparing the nurses to function as palliative care nurses; it went further to these nurses preparing the other healthcare workers as well as the public for this role. The graduates of BSc (Hons) Community Health Nursing Practice Program at Oman Specialized Nursing Institute, organized a scientific day in the year 2014 focusing on the importance of palliative care, services provided and the role of multidisciplinary team that provides multidimensional, culturally relevant and family centered care to their patients. Over 300 multidisciplinary participants attended this scientific event. The event was followed by 2-days of public awareness program that aimed to raise public awareness of palliative care, chronic diseases, prevention of complication and the role of community health nurses as palliative care nurses. Further, due to the increased prevalence and incidence of chronic diseases and changes in the epidemiological characteristics of the Omani population, the Ministry has now approved the palliative care program resorting it administratively under the Primary healthcare department. In addition, there are 24 more nurses being prepared to function as community health nurses providing palliative care for those patients who need it in different community settings and the efforts to build a strong system of palliative care are going on.

Recommendations

These efforts of moving towards palliative care can go unnoticed if a clear plan and recommendations were not followed when preparing for the move. Thus, it is considered important to focus efforts on four main areas when planning to move towards palliative care. These areas are: education, service, policy and research.

Palliative Care Education

As the world witness a demand for end of life care, nurses need to be prepared educationally at different levels to be able to take part in providing care for the terminally ill at different stages (EAPC, 2004). Bush (2012) suggests that the undergraduate nursing programs should include a course in palliative care taught by skilled palliative care specialists and includes both theoretical and practical components. According to the European Association of Palliative Care (2004), health professionals cannot receive the same level of training. The roles and responsibilities of healthcare professionals towards both the patient and the team might differ, as does the number and type of patients they come in contact with. Medical practitioners also call for a coordinated palliative care model whereby basic and specialist preparation need to be recognized to help address the growing need of palliative care services (Quill & Abernethy, 2013).

Palliative care education focuses on the art and science of caring for and relieving the suffering of individuals living with serious chronic, life-threatening and life-limiting illnesses. Preparing a health workforce able to address the growing need for palliative care services can be enhanced by introducing basic palliative care education followed by the advanced specialist palliative care education (Hrowitz et al., 2014). Core precepts of pain and symptom management, communication skills, and care coordination for patients with serious or life-threatening illnesses are the key components of the basic level educational preparation for these professionals (EAPC, 2004).

The European Association of Palliative Care (2004) recommends many strategies "beyond the lecture" that can enhance the teaching in palliative care and result in enhanced learning by participants. Diverse methods of teaching are also likely to enable the learner to reflect upon their experiences, beliefs, and values that will also facilitate more effective care giving. In Oman, it is recommended that palliative care education be on the national agenda for the efforts to improve nursing education and services provided by these nurses when care for ethnically diverse population in different settings.

Nurse Education in Oman

As the European Association of Palliative Care model is a well-known model that has been utilized for years in Europe and other places, it is recommended that Oman adopts such a model as a general framework for recommendation of palliative care education at different educational levels in Oman. The context of the specificity of each level is mapped across the health professions education vision of Oman.

Level A: Basic (Undergraduate)

All Bachelor in Nursing programs' curricula should include a competency related to knowledge of Palliative care. In this, the students should be taught the importance of listening, pain and symptom management, therapeutic communication, ethics, bereavement support and psychosocial care.

Level A: Basic (Post-Graduate)

At this level, all courses to include a competency on application of palliative care approach within the specialty areas wherein the students will learn the multidisciplinary nature of pain and the tools used to guide pain assessment, differing modes of administration of medication to relieve symptoms of pain and adjuvant analgesics and associated side effects. They should also be taught proper handling of physical, psychosocial and spiritual needs of the patients in addition to providing culturally sensitive care and emotional guidance to families in their grief.

Level B: Specialist (Post-Graduate)

Targeted towards nurses who work in specialist palliative care services or in general setting but act as a resource person e.g. oncology nurses, community, elderly, etc., where they will explore the core concepts of palliative care including practice standards, symptom management, communication skills, evidence-based practice, non-cancer contexts, bereavement care, psychosocial issues and care and support for carers. At this level, nurses are also challenged to learn advance pharmacology to manage pain and other symptoms. Thus, case application and small group discussion can be valuable in developing plans of care. Another common aspect of post graduate education is discussion of the many ethical issues involved in palliative care. Nurses are sometimes involved in patient-family discussions regarding advanced directives, withdrawal or withholding nutrition or hydration, and many other complex decisions related to the end of life care. They should be prepared in order to function in this role successfully.

Level C: Nurse Practitioner (Masters)

Palliative care nurse practioners are responsible for palliative care units or provide palliative care consultancy, research or education. Their education is directed towards teaching them about goals of care; assessment and alleviation of complex symptoms relating to care of patients and families experiencing serious life-threatening illnesses. Students taking this specialty analyze the impact of such illnesses on patient, family, community and the health care system, through advance care planning; comprehensive assessment; communicating bad news; pain management; managing depression, anxiety, delirium and sudden illness; withdrawing or withholding treatment and medical ineffectiveness. They also learn about the last hours of living; legal issues; psychosocial issues; gaps in palliative care; elements and models of end-of-life care. In addition, the availability of resources and barriers to care are analyzed within the context of various settings. The leadership role of the advanced practice nurse in palliative care is delineated with emphasis on policy development, protocols, and standards of practice, fiscal management, research utilization, quality improvement, patient advocacy, ethics, social-cultural issues and the role of the nurse leader in the interdisciplinary team. Students participate in professional team meetings, family meetings and patient support groups.

Service

Although training nurses has come a long way in Oman; there is no comprehensive sustainable training for nurses to take the role of a palliative care nurse in Oman. There is a clear need for a comprehensive in-service training program that includes symptoms management especially pain management, psychosocial care, communication, complex decision making and end of life care. Once nurses are prepared for taking this role, there should be a program that raises public awareness regarding palliative care. The Omani healthcare system, like any other systems, should overcome the dichotomy of cure/care and make the palliative care dedicated to promoting quality of life. The misconception that palliative care is only provided at the time of death or dying should be dealt with wisely as palliative care belongs throughout the continuum of care. Palliative care should be started as early as the time of diagnosis of any kind of life threatening diseases. This will enable better coping and quality of life. In addition, there is a need for integrating multidimensional assessment for providing holistic, patient and family centered comprehensive health services. In doing so, using a multidisciplinary approach is recommended.

Policy

One of the main dimensions that need to be focused on in order to initiate an organized palliative care system is focusing on policies. In order to have a sustainable palliative care system, palliative care should be integrated into the routine practices in caring for all patients with chronic life threatening diseases. Resources necessary for such a change in the system must be allocated including human resources. In addition, clear policies and guidelines to define the role of a palliative care nurse and the standards of practice must be developed. In order to make the system more organized, a cost effective service model that is readily available to patients in different settings and that is culturally oriented and suites the healthcare system of the country must be employed. To reach to a better state of the art palliative care system, it is advised to develop partnership and benchmarking with national and international institutions for coordinating palliative care efforts.

Research

The advancement and development of any specialty is dependent on a great extent on the quantity and quality of research that expands on the body of knowledge. Similarly, palliative care requires to be put as one of the areas of health research priorities in the Ministry of Health to advance its practice. Multidisciplinary collaborative studies in palliative care should be encouraged. There is a strong need for funding research areas that are related to palliative care such as pain management, service evaluation and impact or outcome of service or training as well as culturally sensitive care provided. In order to support researchers in conducting research in this filed, the system should encourage them to find new sources of funding such as involving pharmaceutical or insurance companies to fund researches related to palliative care. This will not only promote research but will advance the field of palliative care practice in the country.

In conclusion, Oman like any other country is moving towards modernization. Advances in science and modernization affected the way people live, the way they get sick and the way their life ends. In all these situations, what is thought to be important is to maintain a high quality of life. To do so, the new roadmap points towards palliative care nursing.

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Multidisciplinary Palliative Care and the Ethics of Patient Care

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Abstract/Summary

The world is in the midst of an unprecedented change in demographics as the result of a rapidly increasing aging population. As a consequence, non-communicable diseases (NCDs) of aging, especially cancer, cardiovascular disease, chronic pulmonary disease, and diabetes are rapidly becoming the dominant causes of morbidity and mortality worldwide, even in low-income nations. By virtue of their complexity, chronicity, and progressive nature, NCDs are also associated with a significant burden of suffering as well as increasing stress on limited health care resources. Palliative care is a resurgence of an old principle within medicine, i.e., caring for the suffering of persons while also treating their diseases whenever possible. Working within a multidisciplinary team approach, palliative care addresses the distress of persons with life-threatening illnesses across all four domains of Cicely Saunder's *Total Pain:* the physical, psychological, social, and spiritual aspects of the human person. Ideally, palliative care should be available throughout the entire continuum of care for seriously ill patients from the outpatient through all inpatient settings and wherever a person calls home. With recent studies demonstrating not only enhanced quality of life but also improved survival with lower costs of care, palliative care is rapidly becoming the standard of care for patients with advanced illnesses.

"If there is a meaning in life at all, then there must be a meaning in suffering. Suffering is an ineradicable part of life, even as fate and death. Without suffering and death human life cannot be complete."[1]

Rapid worldwide demographic changes are occurring at a dizzying rate. Where once communicable diseases had been the dominant scourges of humanity, non-communicable diseases (NCDs) of aging, e.g., especially cancer, cardiovascular disease, chronic pulmonary disease, and diabetes, are rapidly supplanting them as the major sources of human misery and mortality, even in Sub-Saharan Africa where malaria and more recently HIV/AIDS have held sway. Ironically, a major reason for this dramatic change is the success of modern medicine, especially public health, in reducing infant mortality through effective preventive measures including clean water, better nutrition and immunization programs. It is predicted that by the year 2045 the number of older persons (60 years of age and greater) will exceed the number of children (15 years of age and less) in the world. This shift had already occurred in developed countries by 1998. Another factor accounting for the rapidity of the demographic shift in developed countries besides increased longevity has been the steady decrease in fertility. By way of historical comparison, the proportion of the world population made up by older persons in 1950 was 8%, in 2009 it was 11%, and in 2050 it is projected to be 22%. Among the elderly, the fastest growing segment is the so-called *oldest-old*, i.e., persons who are 80 years of age and older. With this shift will come ever-increasing medical, social, and economic challenges that will stress and potentially overwhelm health care systems, pension plans, and available social support. Another way to highlight the tremendous challenge facing the next generation is to consider the number of working persons available to support those who are no longer able to work due to advanced age. In 1950, there were twelve potential workers to support each elderly person 65 years and older, in 2009, there were nine and in 2050 there will be approximately four.[2]

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[1] Viktor Frankl, *Man's Search for Meaning*, p. 67, Beacon Press, Boston, MA 2006

[2] United Nations World Ageing Report 2009; p. viii; http://www.un.org/esa/population/publications/WPA2009/WPA2009_WorkingPaper.pdf accessed 12 March 2013

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By their complexity and chronic nature, NCDs are pushing health care costs in an upward spiral that soon may be out of control. It is projected that between 2011 and 2030 there will be a cumulative economic loss of $47 trillion worldwide from NCDs and mental illness. The leading NCDs: cancer, cardiovascular disease, chronic pulmonary disease, and diabetes will account for approximately $30 trillion of the loss.[3] Even in developed countries the catastrophic health expenditures related to NCDs are threatening to overwhelm available resources. It is not difficult to imagine the enormous challenge that will be experienced by lower and middle-income nations, which have fewer resources to direct to health care. Because NCDs are chronic and progressive in nature, the associated burdens of pain, other symptoms, and disability will add significantly to the already deep well of suffering experienced by so much of the world's population.

What kind of response has been proposed by the World Health Organization to address the epidemic of NCDs? Primarily, preventive measures have been proposed including: educational programs to reduce tobacco and alcohol consumption, dietary measures, more aggressive disease surveillance, and selective immunization programs to help reduce the incidence of certain common cancers, e.g., vaccination against human papilloma virus to reduce the incidence of cervical cancer. None of these measures will address the challenges posed by mental illness, dementia and other NCDs. Unfortunately, very little attention has been given to the enormous burden of suffering that is already present and will only increase as the epidemic of NCDs expands.[4] The poignant nature and scope of the current problem of unaddressed human misery is highlighted in this quote from Human Right's Watch: "In September 2008, the World Health Organization (WHO) estimated that approximately 80 percent of the world population has either no or insufficient access to treatment for moderate to severe pain and that every year tens of millions of people around the world, including around four million cancer patients and 0.8 million HIV/AIDS patients at the end of their lives suffer from such pain without treatment."[5]

When discussing human suffering, it is important to distinguish between pain and suffering. Although physical pain can be a major component and initiator of suffering, the sensation of pain alone does not adequately account for the phenomenon known as suffering. Suffering affects the whole person and on some level, consciously or perhaps even unconsciously, is perceived by the person as a threat to one's integrity.[6] The meaning associated with a given symptom may come closer to the phenomenon of suffering. Thus, even a low intensity pain that would otherwise be quite well tolerated may become intolerable, if it is associated with a strong emotional response and meaning, e.g., it may be identified with the recurrence of a cancer that had been in remission. Dame Cicely Saunders, the founder of the modern hospice movement coined a phrase, *Total Pain* that in very practical terms addresses the full experience of human suffering. Distress or pain is experienced in at least four major domains that she has identified as physical, psychological, social, and spiritual.[7] A person may experience great physical pain but as the pain persists it acquires meaning within the other domains of Total Pain such that it affects the suffering person's psychological and emotional state, the person's relationships with others as social pain, and ultimately in a spiritual or existential sense as the suffering one tries to make sense of the pain and grapples to find meaning in the suffering that is being experienced. Alternatively, distress might initially present within one of the other domains, even for example as primarily spiritual pain and yet by virtue of the unity of the human person will inevitably spread to and be experienced within the other domains. Thus, unresolved psychological, social, or spiritual pain can cause physical pain to be unresponsive to massive amounts of opioid analgesics. On the other hand, integrity in the psychological, social, and spiritual domains of the person can minimize physical distress.

The WHO definition of palliative care is: "…an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual. Palliative care:

- provides relief from pain and other distressing symptoms;
- affirms life and regards dying as a normal process;
- intends neither to hasten or postpone death;
- integrates the psychological and spiritual aspects of patient care;
- offers a support system to help patients live as actively as possible until death;
- offers a support system to help the family cope during the patient's illness and in their own bereavement;
- uses a team approach to address the needs of patients and their families, including bereavement counseling, if indicated;

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[3] Ibid.

[4] Ibid.

[5] From "Please, do not make us suffer any more…" Access to Pain Treatment as a Human Right, Human Rights Watch, p. 2; document accessed at http://www.hrw.org/en/reports/2009/03/02/please-do-not-make-us-suffer-any-more-0 on 14 March 2013

[6] Cassell, EJ. The Nature of Suffering and the Goals of Medicine, *N Engl J Med* 1982; 306:639-645.

[7] Saunders, C, and Sykes, N. *The Management of Terminal Malignant Disease*, pp. 1-14; 3rd ed. Hodder and Stoughton, London 1993.

- will enhance quality of life, and may also positively influence the course of illness;
- is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications."[8]

In the National Consensus Project for Quality Palliative Care sponsored by the National Hospice and Palliative Care Organization (NHPCO), the Hospice and Palliative Nurses Association (HPNA), and the American Academy of Hospice and Palliative Medicine (AAHPM), eight clinical practice domains were identified within palliative care to highlight areas for development and quality improvement.[9] They include:

1. Structure and processes of care;
2. Physical aspects of care;
3. Psychological and psychiatric aspects of care;
4. Social aspects of care;
5. Spiritual, religious, and existential aspects of care;
6. Cultural aspects of care;
7. Care of the imminently dying patient; and
8. Ethical and legal aspects of care.

Although in the United States (US) due to the Medicare benefit, hospice has come to mean care for terminally ill persons in the last six months of life, outside of the US hospice and palliative care are often used interchangeably to describe care for those persons who have life-threatening illnesses with an associated burden of suffering. In the broadest sense, palliative care embraces not only care of persons with life-limiting illnesses but also persons, who though they may have been cured of a particular life-threatening illness, e.g., cancer, continue to experience suffering as a consequence of the disease process or its treatment. Good control of pain and other debilitating symptoms is an essential prerequisite for improved function, which in turn directly affects the quality of life of suffering persons, regardless of their prognosis.

Considering the broad range of domains of care which comprise palliative care that were noted above, it would be very difficult, if not impossible, for one single professional discipline to effectively address all of the needs of those who are suffering with advanced illnesses. Palliative care is essentially a team effort. The more members who can be fully integrated within the team, bringing their unique perspectives, the better. At a minimum, a multidisciplinary palliative care team in the US is usually comprised of representatives from nursing, medicine, social work, and pastoral care. The additional participation of representatives from psychology, pharmacy, bioethics, integrative medicine (e.g., massage, music and art therapy, acupuncture, herbal medicine), and volunteers would be ideal depending on resource constraints.

Although individual members of the team have their own spheres of professional expertise, ideally they attempt to create a symphony of common effort toward one goal, care for the suffering one, that must extend beyond their own perspectives.

Implicit in such an approach, is the possibility that empirical experience, in fact any life experience, may often be more useful when confronting a mystery than formal knowledge alone. Humility is an essential ingredient in the dynamics of multidisciplinary teamwork. Solutions to problems can come from unexpected and apparently unlikely sources, if team members are able to break free of the prejudices and mindsets inherent to their original discipline. Listening in all its facets must be cultivated as the first and most critical tool of the healer, not only listening to other members of the multidisciplinary team, but especially to the patient. Ultimately, the suffering patient and his/her family must be the central members of the multidisciplinary team. Patients often hold within themselves the solutions to their suffering. It is the task of the multidisciplinary team to support patients on their journeys of suffering, never abandoning them, and offering them tools from their collective expertise to ease the way.

Where is palliative care needed? A famous bank robber was once asked why he robbed banks. His reply was "because that's where the money is."[10] By the same token, palliative care should be offered anywhere within the continuum of patient care where there is suffering. Different points within the continuum of patient care where palliative care can make a valuable contribution include:

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[8] Accessed at https://apps.who.int/dsa/justpub/cpl.htm on 23 June, 2011. National cancer control programmes: policies and managerial guidelines, 2nd ed. Geneva, World Health Organization, 2002.

[9] National Consensus Guidelines for Quality Palliative Care can be accessed at http://www.nationalconsensusproject.org/guideline.pdf.

[10] For more on the legendary bank robber http://en.wikipedia.org/wiki/Willie_Sutton

- Emergency departments;
- Acute inpatient medical and surgical units;
- Intensive care units;
- Extended care and rehabilitation units;
- Outpatient clinics, either as dedicated palliative care clinics with case management and/or as consultants supporting other existing specialty clinics, e.g., geriatrics, cardiology;
- Specialized programs, e.g., oncology centers;
- Home hospice either delivered in the patient's home or in a long term care/nursing home setting; and
- Inpatient palliative/hospice care that can be provided during the last days to weeks of life, especially for patients requiring intensive symptom management and 24 hour access to nursing care or who have essentially no home supports.

When should palliative care be consulted? Some of the major reasons to seek palliative care expertise include the following:

- There are physical symptoms related to a life-threatening illness, or its treatment;
- The patient and/or family is experiencing emotional or spiritual distress or there is conflict in the family;
- There has been a lack of response to therapy or there has been a recurrence of the illness after a remission, i.e., progressive cancer;
- There have been more frequent exacerbations or hospitalizations associated with a chronic illness, e.g., congestive heart failure, chronic obstructive lung disease;
- Patients and/or their families have declined or are considering declining life-sustaining or disease-modifying treatments, e.g., further chemotherapy;
- When conflicts in the goals of care occur; and
- Patients are experiencing a general decline in functional status, such as nutritional decline/weight loss, in the setting of advanced age or multiple co-morbid conditions, i.e., failure to thrive or general debility.

It is difficult to define quality of life under the best of circumstances and it may seem to be a futile exercise to attempt to define it for those with advanced life-threatening illnesses. But, there are several factors that probably relate to quality of life that can be directly impacted by palliative care. They include: freedom from pain and other disabling symptoms, maintenance of functional independence to the extent possible, respect for individual freedom and self determination, the ability to pursue sources of meaning, and preservation of personal dignity.

As palliative care programs have been developing, a number of measures have been proposed as ways of measuring the quality of the services provided.[11] Some examples of measures that have been proposed or used in large health care systems like the US Department of Veterans Affairs to measure quality of palliative care include:

- The percentage of patients dying in the hospital with a palliative care consult prior to death;
- The number of days between palliative care consultation and the patient's death;
- The number of deaths in intensive care before and after introducing a palliative care consultation team to the hospital;
- The percentage of patients dying with uncontrolled pain;
- Patient and family satisfaction surveys; and
- Financial outcomes, especially cost avoidance.

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[11] For an excellent discussion and comprehensive list of potential quality measures in palliative care please see: Schenck, A., et al. The PEACE Project: Identification of Quality Measures for Hospice and Palliative Care J Pall. Med. 2010; 13: 1451-1459

A measure of palliative care development at the country level that has been proposed is the measurement of per capita opioid consumption as a surrogate for access to pain relief.[12] Although cost may not be a typical factor measured in determining the quality of palliative care services, it can clearly serve as a barrier or facilitator to their development and thus plays an enormous role in influencing the prioritization of palliative care by ministries of health. Palliative care has been shown to reduce the cost of care for seriously ill, hospitalized patients. For example, in one study in the US, administrative data between 2002 and 2004 from eight US hospitals with established palliative care programs was analyzed. Both patients who were discharged alive and those who died in hospital receiving palliative care consultations were matched by complexity and severity of illness with usual care patients. Palliative care patients who were discharged alive had an adjusted net savings of $1696 in direct costs per admission (P=.004) and $279 in direct costs per day (P<.001) including significant reductions in laboratory and intensive care unit costs compared with usual care patients. Palliative care patients who died in the hospital had an adjusted net savings of $4908 in direct costs per admission (P=.003) and $374 in direct costs per day (P<.001) including significant reductions in pharmacy, laboratory, and intensive care unit costs compared with usual care patients.[13]

Although many palliative care practitioners have noted anecdotally that patients receiving palliative care appeared to often live longer with better quality of life, clear evidence of such an effect of palliative care on survival was lacking until the watershed study of Temel and colleagues that was recently published in which the impact of palliative care introduced at the time of diagnosis was evaluated in patients presenting with stage IIIB and stage IV non small cell carcinoma of the lung.[14] In this randomized trial of the effect of the introduction of palliative care at the time of diagnosis versus standard care in patients presenting with advanced non small cell lung carcinoma, early palliative care was associated with significantly better self-reported quality of life, less depression, and most strikingly, significantly increased survival. “Despite the fact that fewer patients in the early palliative care group than in the standard care group received aggressive end-of-life care (33% vs. 54%, P = 0.05), median survival was longer among patients receiving early palliative care (11.6 months vs. 8.9 months, P = 0.02).”[15] Thus, there is solid evidence supporting the role of palliative care in the care of patients with advanced illnesses not only for improved quality of life but improved survival and reduced cost. Palliative care consultation at the time of presentation for patients diagnosed with advanced cancer has become the standard of care in the US and is rapidly becoming an indispensible element in the care of persons suffering with advanced non-cancer diagnoses.

A final note should be added regarding the difference between cure and palliation in serious life-threatening illness. Human beings are mortally ill from birth. Even the often-remarkable cures of diseases that have prolonged and improved the lives of so many citizens of this planet cannot alter this inexorable truth. Effective curative therapy should also palliate, i.e., it should also relieve pain and suffering. When curative therapy is no longer possible, the original mission of the healing arts should continue in the form of an even greater focus on palliation. For if a person facing death is supported and freed as much as possible from pain and other distress, the real possibility of transcending one’s suffering, of being healed exists. A short clinical vignette may help illustrate this concept.

A 67-year old man with advanced pancreatic cancer presented in a pain crisis with crescendo mid-epigastric pain radiating through to his back. The pain was keeping him from his usual activity of preparing and distributing boxes of food for the poor in his neighborhood. He promptly resumed these activities once his pain was controlled and continued them up to the day before his death.

The Goal of Palliative Care

To relieve suffering, improve quality of life, and transform health care.

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[12] The Pain and Policy Studies Group at the University of Wisconsin have developed this approach to monitoring global palliative care development. For a sample of data from the Eastern Mediterranean region see http://www.painpolicy.wisc.edu/who-regional-office-eastern-mediterranean-emro

[13] Morrison, RS, et al. Cost savings associated with US hospital palliative care consultation programs. Arch Intern Med. 2008;168 (16):1783-1790

[14] Temel, JS, et al. Early Palliative Care for Patients with Metastatic Non–Small-Cell Lung Cancer N Engl J Med 2010; 363:733-42.

[15] Ibid.

Ethical Issues in End-of-Life Care[1]

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Abstract/Summary

Technical advances in the care of advanced illness have created ethical challenges for physicians, patients, and families at the end of life. In the effort to survive longer, they are often confronted with difficult choices regarding medical advances that may inadvertently prolong suffering and the dying process rather than bring healing and recovery. Four major principles of medical ethics assist patients, families, and their physicians in making meaningful and morally acceptable choices with respect to care at the end of life: the Hippocratic principles of nonmaleficence and beneficence , as well as the more recently developed principles of autonomy and justice. The nature of these principles and their application in decision-making and communication during the care of patients with advanced illnesses will be reviewed.

Suffering has been defined as *"...the state of severe distress associated with events that threaten the intactness of the person."*[2] Because of technical advances in the care of critical illness, physicians, patients, and families are often confronted with ambiguous circumstances in which medical 'progress' may inadvertently prolong suffering and the dying process rather than bring healing and recovery. Suffering or perceived suffering may often be the underlying issue that enervates many of the ethical conflicts that arise during the care of patients with advanced life-threatening illnesses. In some very real sense, suffering defines ethics. If ethics is "a branch of philosophy dealing with what is morally right or wrong"3 which would guide human behavior, then how one understands suffering will guide ethical inquiry.

The objectives of this review article are to: 1) review major principles of medical ethics relevant to the care of terminally ill patients; 2) explore further the principle of autonomy and its application to advance directives, informed consent, and medical futility; 3) define an ethical process for communicating bad news and negotiating decisions at the end of life; and 4) characterize ethical differences between withholding or withdrawing life-sustaining therapies and physician-assisted death.

Ethical Principles Relevant to End-of-Life Care

A patient's suffering and the physician's mandate to address suffering provide the context for the application of four major principles of medical ethics: nonmaleficence, beneficence, autonomy, and justice. The so-called rule or principle of 'double effect' will be reviewed later in this article in conjunction with the discussion of physician-assisted death.

Nonmaleficence and beneficence are Hippocratic principles, in which nonmaleficence specifically enjoins physicians to not harm patients (exacerbate their suffering) and beneficence goes further in insisting that physicians accomplish a positive good for their patients (relieve their suffering). For many centuries these two principles, in balance, have sustained a medical paternalism in which physicians have held the primary decision-making authority for their patients. More recently, a third principle, i.e., autonomy, has become prominent, especially in Western Europe and North America. Autonomy recognizes the right of self-determination, or in the medical context, the right to establish one's own goals of care. With progression of an advanced illness there is increasing debility and loss of independent function that erodes a patient's autonomy. This progressive loss of autonomy, inasmuch as it further threatens the integrity of the person, adds to the suffering of those with advanced illnesses. Consumer autonomy, an extreme application of the principle of autonomy, views healthcare as a commodity to be purchased and received

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[1] This review is a revised and abridged version of Hinshaw DB. Ethical issues in end-of-life care. J Med Liban 2008; 56 (2): 122-128.

[2] Cassell, EJ. The nature of suffering and the goals of medicine. NEJM 1982; 306: 639-45.

[3] http://www.merriam-webster.com/dictionary/ethic

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on demand. It has almost completely replaced the old medical paternalism with the concept that "the customer (i.e., patient) is always right," potentially leading to requests for inappropriate or even futile medical treatments. In direct opposition to consumer autonomy, is the fourth major ethical principle, justice. The principle of justice emphasizes the need for the equitable distribution of resources, including the often-limited access to health care. An individual's desire or demand to have any and all potential treatments for an advanced incurable illness (consumer autonomy) may be in direct conflict with the just distribution of care for others who are also suffering, because of the limited resources available. Thus, the ethical responsibility of a physician to an individual patient is limited to the extent that utilization of resources for the individual unfairly compromises the ability to provide similar resources to others.

In the United States, the transition from medical paternalism toward patient autonomy has been supported by certain legal decisions. In Schloendorff versus New York Hospital (1914), the right of patient self-determination was established: *"Every human being of adult years and sound mind has a right to determine what will be done with his own body."* [4] In the more recent case of Karen Ann Quinlan (1976), an individual who was in a persistent vegetative state on a ventilator, the New Jersey Supreme Court recognized the principle of a surrogate decision-maker speaking for an incompetent patient.[5]

Advance Directives, Informed Consent, and Medical Futility

A practical extension of patient autonomy has been the development and use of advance directives. Typically, advance directives can be in the form of a living will or medical directive in which treatment preferences usually related to care at or near the end of life (especially regarding attempts at resuscitation) are documented and may also include a durable power of attorney for healthcare in which a surrogate decision maker is identified (often one's spouse or other close relative). In actual practice, advance directives have not been as useful as hoped. It is almost impossible to anticipate every possible situation that might arise, especially during intensive care of a critically ill individual, in which specific decisions can be made in advance. Also, even when advance directives have been prepared they are often ignored, either because of the urgent nature of a given situation and lack of ready access to the advance directive or because of differences in interpretation of the specific wording of a living will or medical directive. In general, designation of a durable power of attorney for health care (i.e., surrogate decision maker) may be more helpful.[6]

In the United States, a surrogate decision-maker (DPOA) would be approached by the patient's physician(s) for assistance with healthcare decisions only when the patient has lost capacity for decision-making. In determining a patient's capacity for decision-making the following criteria should be met: 1) the patient should be able to clearly identify a preference with regard to a specific intervention; and 2) the patient should demonstrate a clear understanding of the consequences of his/her choice and be able to clearly articulate this to his/her physician. Any physician can determine capacity for decision-making. However, competence for decision-making, a legal designation, requires court action and psychiatric consultation in the United States. If a patient's capacity for decision-making is lost (e.g., secondary to delirium), then the surrogate decision-maker/DPOA for healthcare assumes the role of making a choice for the patient based on his/her understanding of *the patient's preferences* not those of the DPOA. If the patient regains capacity for decision-making (e.g., delirium resolves), the role of the surrogate decision-maker is superseded by the patient's restored autonomy. Designation of a surrogate decision-maker in the form of a DPOA for healthcare creates flexibility in that the DPOA can address whatever situation may arise based on his/her understanding of what the patient's values and preferences are. Perhaps, the greatest value of identifying a surrogate decision maker is creating the opportunity for a more dispassionate discussion with family and loved ones regarding care preferences at the end of life before an actual crisis is encountered, since this discussion will likely inform discussions in the future when the patient has lost capacity for decision-making and the family may be in considerable emotional distress.

For patients and their surrogate decision-makers to make truly autonomous decisions, they must be informed. Too often in American medicine this has been translated in practice into giving patients a long list of potential interventions that are components of a resuscitative effort (e.g., electric shocks, external cardiac massage, ventilatory support, intravenous pressors) without putting such interventions in a larger context. Because physicians are pledged to preserve life, we are often very uncomfortable addressing the issue of death, especially when it is the large, silent but palpably oppressive presence during a discussion about goals of care. Instead of asking: "if your heart stops, would you want us to start it again...?" try: "when (if) you die from this illness an attempt to resuscitate your body will happen (by default). Would you want this to occur? It will not change anything but potentially be disturbing for those caring for you and your loved ones who might witness it." It can also

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[4] Schloendorff vs. New York Hospital, 211 N.Y. 125, 129, 105 N.E. 92, 93 (1914).

[5] In re: Quinlan, 355 A2d 647 (JN), 429 US 922 (1976).

[6] Fagerlin, A, Schneider CE. Enough: the failure of the living will. *Hastings Center Report* 2004; 34 (2) : 30-42.

be very helpful to frame such discussions in the larger context of prognosis. If, for example, a patient with advanced cancer on the basis of functional status has a projected survival of weeks to months at best, any attempts at resuscitation will usually be futile and essentially prolong the dying process and the patient's suffering. On the other hand, an individual with advanced cancer with a projected survival based on functional status of months and who is still receiving active disease-modifying therapy (e.g., chemotherapy) may be an appropriate candidate for more aggressive resuscitative measures. All of this presupposes an informed discussion of prognosis and the mention of *death* itself in such a discussion. Otherwise, how can patients (or their surrogates) have a realistic context in which to make meaningful choices relating to their care that are consistent with their own personal values and goals?

In some countries (e.g., England) there is no provision for creating a DPOA to empower a surrogate decision-maker in the event that a patient loses decisional capacity. In England, when the capacity for autonomous decision-making by the patient is lost, informed consent cannot be obtained (in contrast to the United States where a surrogate decision-maker would act).[7] Under such circumstances, the physician must make the decision guided by the 'best interests standard'. When this standard is used to address practical problems, asking the question: "What is in the best interests of this patient at this time?" should help guide the medical decision-maker(s) to pick from various options *"that reasonable persons of good will would consider acceptable in similar circumstances..."*[8] Ideally, such an approach in addressing decision-making for incapacitated individuals would attempt to identify and act on behalf of the best short- and long-term interests of the patient while minimizing the associated burdens. Choices made for incapacitated patients using the 'best interests standard' should meet a minimum acceptable level of care (e.g., what reasonable and informed persons would regard as acceptable for themselves under similar circumstances). Choices made for incapacitated individuals should be consistent with accepted moral and legal duties to vulnerable individuals.[9] One can readily see that the 'best interests standard' represents an approach more consistent with a medical paternalism model of care. In most instances, it should be an effective guide for good ethical care. However, historical precedents have already occurred in which vulnerable individuals lacking capacity for decision-making fell victim to a new moral standard imposed by the state and implemented by physicians (e.g,. the destruction of the mentally ill in Nazi Germany). Thus, the principle of autonomy as applied to medical decision-making in the context of patient incapacitation is in a process of evolution depending on the country and culture.

Medical futility has been defined as *"... performing treatments that have no reasonable chance of achieving a therapeutic benefit for the patient."* [10] Fundamentally, physicians should not wait for a determination of futility to introduce palliative care. Waiting for futility implicitly says to the patient: "If we think you will live, we will tolerate your suffering, but if we think you will die, we will treat your suffering!" Emphasizing palliation in the face of uncertainties regarding futility is not only the right thing to do; it may help to clarify what is futile care. Ultimately, futility cannot be only a medical determination. The patient's and family's values must also play a major role in defining futility in tension with the complexities of the given medical condition and situation.

Communicating Bad News and Negotiating Decisions at the End of Life

In keeping with the Hippocratic principles of nonmaleficence and beneficence, if done well, communication and negotiation with patients and families about advanced life-threatening illnesses can potentially avoid great psychological harm and help make a very difficult transition easier. Cultural differences exist regarding disclosure of serious diagnoses and prognoses.[11] In some cultures communication may be directed through another close relative (e.g., son) rather than directly to the patient. Concerns also exist in some cultures that disclosing bad news to a patient may have an adverse effect on the patient's outcome, potentially robbing them of hope. In contrast to this, in the multisite longitudinal *Coping with Cancer Study*, patients with advanced cancer, who were able to identify themselves as "terminally ill" and "at peace" were defined as having 'peaceful awareness' of their prognosis. 'Peacefully aware' patients had less psychological distress, were more likely to have advance care discussions with their physicians, and had the highest overall quality of death as reported by their caregivers after their death. Caregivers of 'peacefully aware' patients were in better physical and mental health six months after the loss than the caregivers of those who were 'aware' but not peaceful. Importantly, the majority of patients who were aware that they were terminally ill were also able to be at peace.[12] With the advent of the Internet, cultural change is happening at an extraordinary pace. Even prior to the almost instant global spread of ideas that can occur today, US physicians' attitudes regarding disclosure of a cancer diagnosis

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[7] Jones, BJM. Nutritional support at the end of life: the relevant ethical issues. *Eur J Gastroenterol Hepatol* 2007; 19: 383-8.

[8] Kopelman, LM. Quoted from p. 188 in The Best Interests Standard for Incompetent or Incapacitated Persons of All Ages, *J Law Med & Ethics* (Childhood Obesity) Spring 2007: 187-196.

[9] Ibid.

[10] Kollef, MH. Outcome Prediction in the ICU. In: Curtis JR, Rubenfeld GD, editors. *Managing Death in the Intensive Care Unit*, Chapter 5. New York, NY: Oxford University Press, 2001: 39-57.

[11] Thomas, ND. The Importance of culture throughout all of life and beyond. Holist Nurs Pract 2001; 15:40-46.

[12] Ray, A, et al. Peaceful awareness in advanced cancer patients. *J Pall Med* 2006; 9(6): 1359-1368

to patients underwent a complete 180-degree reversal in less than twenty years. Whereas in 1961,[13] ninety percent of physicians from a large academic teaching hospital indicated in their response to a questionnaire that they routinely did not disclose a cancer diagnosis to their patients, when US academic physicians' attitudes and behaviors related to disclosure were again assessed in 1977 with the same questionnaire, ninety-seven percent indicated that they preferred to inform their patients of a cancer diagnosis.[14]

To communicate and negotiate effectively and compassionately, it is helpful to pursue an organized and thoughtful process, keeping the needs of the patient and family in mind. Find a quiet, private place. Be sure to minimize potential interruptions (e.g., turn off pagers and cell phones; have someone else respond to calls or pages). Make sure the timing is right for the patient and that there is enough time. Give the news in person. Avoid giving bad news over the telephone, if at all possible. Sit close to the patient. Give the impression by your body language that you have unlimited time to spend with the patient and family and that they have your full attention. Standing at the door, implies that you might leave (escape) at any time and thus implicitly abandon the patient. Avoid using bad body language – don't look too relaxed. Don't cross your legs, but lean forward toward the patient making good eye contact, while being sensitive to important cultural and gender differences that may impact communication. Whenever possible and if desired by the patient, it is important to have a family member or friend present to provide comfort and support to the patient. At the beginning of the conference, clarify the patient's understanding of the situation. *Listen* to patients' reported understanding of their disease and condition. Not infrequently patients may have already guessed the bad news and may volunteer their worse fears, which can make the physician's task easier. Remember that giving bad news is like any other medical procedure in that it can cause potential harm or suffering and thus requires the patient's informed consent. Giving a "warning shot" can do this. For example, "I am afraid I have bad news for you." Patients can then indicate that they are not ready to hear it yet or can identify a family member to serve as the conduit of the information. Denial is such a strong reaction and defense mechanism for humans facing their death that it should be addressed in a gentle manner. When confronted with this response, it may be appropriate to indicate to patients that the conversation still needs to occur but that it will be deferred awhile until they are ready. *Always tell the truth, but don't force it on someone who is not yet ready to hear it.* If necessary, the truth can be shared incrementally without lying to patients. Pause after communicating the bad news. Silence is a good thing but often is very difficult to maintain while the patient absorbs the full shock of the bad news. Allow the patient to react appropriately (e.g., tears, anger) to what may be very devastating news indeed. Convey hope that is realistic to the circumstances, if no longer for cure, then for good symptom control and quality of the life remaining. Most importantly, reassure patients that they will not be abandoned. Encourage patients to identify realistic goals that are consistent with the likely prognosis that will help the medical team prioritize and individualize their care in order to honor the stated goals.

Withholding/Withdrawing Life-Sustaining Therapies versus Physician-Assisted Death

There is no fundamental difference ethically between withdrawing or stopping a treatment that is no longer beneficial and not starting or withholding such a treat- ment.[15] Once a decision is made to withhold a "life-sustaining" treatment, other ongoing treatment should be reviewed as to the appropriateness of its continuation, as well.

Another legal precedent in the United States, the case of Nancy Cruzan in 1990 has informed the ethical and legal discourse regarding withdrawal of any form of therapy in an incapacitated individual. Specifically, this case involved the proposed withdrawal of artificial nutrition (tube feedings) in a patient who was in a persistent vegetative state. In the legal opinion, it was concluded that the surrogate decision-maker must demonstrate "clear and convincing evidence" that the incapacitated patient would have rejected such treatment.[16] The effective outcome and interpretation of this decision in practice has been to determine that there is no essential difference between ordinary and extraordinary therapy.[17] It's possible to reject any treatment, although it may still be more difficult for a surrogate decision-maker to reject artificial nutrition/hydration on behalf of an incompetent or incapacitated patient.

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[13] Oken, D. What to tell cancer patients: A study of medical attitudes. *JAMA*, 1961; 175 (13): 1120-1128.

[14] Novack, DH, et al. Changes in physicians' attitudes toward telling the cancer patient. *JAMA*, 1979; 241 (9): 897-900.

[15] Mularski, RA, Osborne ML. The changing ethics of death in the ICU. In: Curtis JR, Rubenfeld GD, editors. *Managing Death in the Intensive Care Unit*, Chapter 2. New York, NY: Oxford University Press, 2001: 7-17.

[16] Cruzan vs. Director, Missouri Dept of Health, 497 US 261 (1990).

[17] Annas, GJ. Nancy Cruzan and the right to die. *N Engl J Med* 1990; 323: 670-3.

The decision to withdraw life-sustaining therapy is rarely an emergency. It is essential to take all the time necessary to resolve any conflicts that may exist between the medical staff and family members or that may exist within the medical team. Clinicians should be aware that personal biases and values often play a dominant role in their clinical decisions (as opposed to objective data). All team members (attending physician, physicians-in-training, nurses, social workers, etc.) who have a direct role in the patient's care should have input in the process. As much as is possible, build consensus. Some important principles to consider when contemplating withdrawal of life-sustaining therapy include:

1. All treatments can be withdrawn. If circumstances justify withdrawal of one therapy (e.g., intravenous pressors, antibiotics), they may also justify withdrawal of others.
2. Be aware of the symbolic value of continuing some therapies (e.g., nutrition, hydration) even though their palliative value is questionable.
3. Prior to withdrawing life-sustaining therapy ask the patient and family if a spiritual advisor (e.g., pastor, imam, or priest) should be called.

Essentially, the rule or doctrine of 'double effect' states that a treatment (e.g., opioid administration in the terminally ill), which is intended to accomplish a positive good and not harm the patient (i.e., relieve pain) is ethically acceptable even if a potential consequence (side effect) of its administration is to shorten the life of the patient (e.g., by respiratory depression). The use of opioids for pain relief in advanced illness has been cited frequently as the classic example for the rule of double effect. However, it has been shown from a careful review of the literature, that in the vast majority of instances of opioid administration for symptom relief in advanced illness, the rule need not be invoked, since opioids can safely be used without significant risk, if administered appropriately.[18] Thus, in managing the distress of the dying, titrate medications (e.g., opioids, benzodiazepines) to relieve all signs of distress (tachypnea, agitation, grimacing, etc.) prior to removing life support. There is a fundamental ethical difference between titrating medications rapidly to achieve relief of distress and administering a very large bolus, which causes apnea. Some have used what they perceive as ambiguities in the rule of "double effect" in arguments supporting euthanasia and physician-assisted suicide.[19] However, this principle ultimately rests on the intent of the individual acting under its guidance. For the majority of physicians who would not willingly perform euthanasia, the rule of "double effect" underscores the reality that sometimes treatments with potentially dangerous side effects must be used to relieve the distress of our patients; but not with the *intent* of killing them in order to relieve their distress.[20]

To further clarify these issues, in physician-assisted suicide, a physician intentionally provides the means, while the patient is the direct, proximate cause of his/her own death. In euthanasia, the physician is the direct cause of the *intended* death of the patient. With regard to medical ethics, there is no fundamental moral difference between physician-assisted suicide and euthanasia. Intent is everything, but *document* your intent. Thus, withholding or withdrawing treatments, which are no longer beneficial or administering opioids for pain relief that may indirectly hasten death, are not euthanasia.

Now it is time to revisit the assertion that *suffering defines ethics*. The most compelling argument in favor of physician-assisted death relates to suffering. If suffering is the greatest evil (which many advocates of physician-assisted death would endorse), then all means should be available to address it, including intentionally causing the premature death of one's patients. There are a number of reasons to resist embracing such a "solution" to the suffering of our patients.

1. Requests for physician-assisted death are often a sign of un-addressed issues including: inadequately treated physical symptoms (e.g., pain), untreated clinical depression, fear of a loss of control (autonomy), fear of being a burden, and potential existential or spiritual distress.
2. Physical suffering can be relieved without writing a lethal prescription. Distressing symptoms can be controlled in > 95% of cases with medications and supportive care. Terminal or palliative sedation can be used to control very difficult symptoms without taking a life.
3. The end of life is a critical time for personal growth, which would be shortened by premature physician-assisted death. During the last days and weeks of life a number of very important activities can occur including reconciliation and healing of relationships, life review, and spiritual growth as one searches for meaning in one's suffering.

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[18] Sykes, N, Thorns A. The use of opioids and sedatives at the end of life. *The Lancet Oncology* 2003; 4: 312-18.

[19] Quill, TE, Dresser R, Brock DW. The rule of Double Effect: A critique of its role in end-of-life decision-making. *N Engl J Med* 1997; 337: 1768-71.

[20] Sulmasy, DP, Pellegrino ED. The rule of Double Effect: Clearing up the double talk. *Arch Intern Med* 1999; 159: 545- 50.

4. Legalization of physician-assisted death would be inherently unsafe. Patients with limited or unequal access to healthcare (e.g., the poor) would be particularly vulnerable, since physician-assisted death would inherently be quite "cost effective." There have been well-documented failures or "problems with completion" of physician-assisted suicide (complications in 21 of 114 cases reported recently from the Netherlands) that could exacerbate rather than relieve the suffering of the dying.[21]
5. Physician-assisted death poses an inherent conflict of interest for physicians. Physicians can't remain as trusted advocates for the life and health of their patients, if they also may be the means of terminating that same life. With rising health care costs (particularly at the end of life), the pressure for more "cost effective" solutions (e.g., physician-assisted death) will mount. Physician-assisted death is in direct conflict with the Hippocratic oath and tradition.
6. Finally, physician-assisted death represents the very thing the terminally ill fear the most – abandonment. Although physicians may be able to address the physical distress of the dying, they may not have the skills or resources to address deeper, existential issues troubling their patients. This lack of knowledge does not justify taking a patient's life when others who may have the skills and patience are available to help.

Proponents of physician-assisted death often minimize the potential danger of the 'slippery slope.' But, there has nonetheless been an extraordinarily rapid, and for many alarming, movement toward legalization of physician-assisted suicide and euthanasia both within the United States, where physician-assisted death is now legal in five states and in various countries of Western Europe (e.g., the Netherlands, Belgium, and Switzerland). An interesting and presumably more palatable euphemism has also been introduced by proponents: so-called 'physician-aid-in-dying.'[22] The necessity for such an innovation or regression to pre-Hippocratic medicine is primarily justified on the basis of autonomy and individual 'rights,' not on actual evidence of inadequate access to palliative care in the jurisdictions that have sanctioned its performance. What impact such a profound cultural and ethical change might have on health care policy in low-income countries with already limited resources is yet to be seen. The temptations to make the 'easy' choice in favor of encouraging the widespread use of 'physician-aid-in-dying' to relieve governments of their responsibilities to address the needs of persons suffering with advanced illnesses may be very powerful in the future.

Addressing suffering in terminally ill patients translates into:

1. Greater attention to symptom assessment and management;
2. An ongoing dialogue with the patient and family regarding their goals of care;
3. Providing greater social supports to reduce isolation (social pain) during and after disease-modifying treatment;
4. Emphasizing safety in the home and environment of care to enhance a patient's sense of security; and
5. Respecting patients' sources of meaning and values.

It is possible for these basic elements of palliative care to be provided in even the most resource-constrained environments, as long as there is the will and commitment to respect the value of each person, regardless of their condition.

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[21] Groenewoud, JH, et al. Clinical problems with the performance of euthanasia and physician-assisted suicide in the Netherlands. *N Engl J Med* 2000; 342: 551-63.

[22] For example, see https://www.compassionandchoices.org/who-we-are/about/

Characterization of genes responsible for carbapenemase resistance in North Lebanon.

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Abstract

Carbapenems are broad-spectrum antibiotics that constitute the last-line therapeutic option available to treat infections caused by multidrug-resistant bacteria. The most concerning mechanism of resistance is the acquisition of carbapenem-hydrolysing ß-lactamases. The most prevalent carbapenemases are Ambler class A enzymes (such as KPC-type ß-lactamases), class B enzymes (such as VIM-, IMP- and NDM-type metallo-ß-lactamases) and class D enzymes (such as OXA-48).

Objective

The aim of this work is to investigate the mechanisms of resistance to carbapenems in Enterobacteriaceae, Acinetobacter baumannii (A. baumannii) and Pseudomonas aeruginosa (P. aeruginosa) isolated in Northern Lebanon.

Materials and Methods

Of the 2767 Enterobacteriaceae strains were screened for reduced susceptibility or resistance to ertapenem (MIC >0.25mg/L), only twenty-four non-redundant were resistant. beta-lactamase encoding genes (blaTEM, blaCTX-M, blaKPC, blaNDM, blaVIM and blaOXA-48) were detected by PCR amplification. In parallel, the faecal carriage of Enterobacteriaceae exhibiting resistance or reduced susceptibility to ertapenem (MIC >0.25 mg/L) was screened in 2012 from samples obtained from 183 healthy children in the community. For A. baumannii, 4 carbapenem-resistant strains isolated from civilians wounded during the Syrian war were analysed. The presence of blaOXA-23-like, blaOXA-24-like, blaOXA-58-like, blaOXA-143-like and blaNDM was investigated by PCR. Clonal relationships were studied by pulsed-field gel electrophoresis (PFGE), multilocus sequence typing (MLST) and blaOXA-51 sequence-based typing. For P. aeruginosa, 35 imipenem-resistant clinical isolates were studied. The molecular detection for carbapenemase-encoding genes, including blaVIM, blaIMP, blaGIM, blaSIM and blaNDM was carried out. PCR amplification and sequencing of the oprD gene and overproduction of the chromosomal cephalosporinase AMPC and efflux pumps (mexA, mexC, mexE and mexX) were performed.

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Results

The rate of Enterobacteriaceae exhibiting a decrease in susceptibility or resistance to ertapenem from clinical isolates recovered from hospitalized patients increased from 0.4% between 2008-10 to 1.6% in 2012. PCR and sequencing confirmed the presence of the bla OXA-48 gene in 88% of the clinical isolates (n=21/24) and in the three faecal E. coli isolates from healthy children. However, E. coli represented 73% of the OXA-48-producing Enterobacteriaceae collected in 2012. Regarding A. baumannii, all isolates harbored the blaNDM-1 gene and were negative for other tested carbapenemases. They all belonged to the sequence type 85 and formed a single cluster by PFGE. Finally, blaOXA-51-like gene sequencing revealed the presence of the blaOXA-94 variant in all 4 isolates. Finally, 18 out of the 35 isolates of P. aeruginosa harbored the blaVIM-2 gene (16 isolates) or the blaIMP-15 gene (2 isolates). All the isolates had modifications to their oprD gene sequence, including 16 with a stop codon, 10 with an insertion sequence (IS) element, 4 with mutations and 5 in which the gene was not detected. 9 strains harboured the IS element ISPa1328 inserted in OprD nucleotide position 419.

Conclusion

The distribution and diversity of Enterobacteriaceae producing OXA-48 carbapenemase demonstrate that this resistance mechanism is becoming widespread in hospitals and in the community of North Lebanon. Our findings show that Syria constitutes of a reservoir for NDM-1-producing A. baumannii. In addition, these results highlight the need for effective measures to stop the threatening spread of such strains. This study described also the emergence of blaVIM-2 and blaIMP-15 carbapenemase-encoding genes in P. aeruginosa clinical isolates in North Lebanon and also reported the multiple possibilities for becoming resistant to carbapenems, which include the disruption of oprD gene by either mutations, IS elements, gene loss, and/or overexpression of efflux pumps.

Introduction

The carbapenems have the broadest spectrum of all β-lactams, encompassing virtually all bacterial pathogens except mycobacteria, cell wall-deficient organisms, and a few infrequent non-fermenters and aeromonads. They retain activity against Gram-negative bacteria with extended-spectrum beta-lactamases (ESBLs) and against hyperproducers of AmpC enzymes, which are two increasingly prevalent mechanisms that confer resistance to oxyimino-aminothiazolyl cephalosporins [1]. Carbapenemases have been known since the introduction of imipenem in the 1980s, although these enzymes were mainly derived from Bacillus cereus (BCII), Bacteroides fragilis (CfiA) and Stenotrophomonas maltophilia (L1) [2]. Over the past ten years, carbapenem resistant Enterobacteriaceae have been reported worldwide [3]. The first carbapenemase producer in Enterobacteriaceae (NmcA) was identified in 1993 [4], since then, a large variety of carbapenemases has been identified in Enterobacteriaceae belonging to 3 classes of beta-lactamases: the Ambler class A, B and D. P. aeruginosa and A. baumannii are Gram-negative bacilli that in the last decades have become prevalent agents of hospital infection due to high antimicrobial resistance developed by these microorganisms [5]. The increasing trend of carbapenem resistance in A. baumannii worldwide is a concern since it limits drastically the range of therapeutic alternatives. Metallo-beta-lactamases (VIM, IMP, SIM and NDM) have been reported worldwide. The most widespread beta-lactamases with carbapenemase activity in A. baumannii are carbapenem-hydrolysing class D beta-lactamases (CHDLs) that are mostly specific for this species [6]. P. aeruginosa have an extraordinary capacity for developing resistance to almost any available antibiotic through mutations in chromosomal genes, and on the other hand to the increasing prevalence of transferable resistance determinants, particularly those encoding class B carbapenemases [or metallo-beta-lactamases (MBLs)] or extended spectrum b-lactamases (ESBLs), frequently co-transferred with genes encoding aminoglycoside-modifying enzymes [7, 8]. The aim of this work is to investigate the mechanisms of resistance to carbapenems in Enterobacteriaceae, A. baumannii and P. aeruginosa isolated from patients in Northern Lebanon.

Materials and Methods

Bacteria

For Enterobacteriaceae, a total of 2767 strains isolated from clinical samples in Nini Hospital, North Lebanon, between January 2008 and December 2012 were screened. Nini Hospital has 125 general-care beds and 12 intensive care beds. In parallel, Enterobacteriaceae exhibiting decreased susceptibility or resistance to ertapenem (MIC >0.25 mg/L) were collected from 183 faecal samples obtained in December 2012 from healthy children who had not been admitted to hospital and had not taken antibiotics in the previous 6 months. Non-redundant intestinal Enterobacteriaceae were recovered by spreading the corresponding faecal samples on MacConkey agar plates (bioMérieux, Marc l'Etoile, France) supplemented with ertapenem (0.5 mg/L) or cefotaxime (4 mg/L). For A. baumannii, 4 carbapenem-resistant A. baumannii strains isolated in 2012 in the Tripoli Government Hospital (with 120 general-care beds) North Lebanon, from civilians wounded during the Syrian war, were analysed. Finally, 35 imipenem-resistant P. aeruginosa clinical isolates collected between March 2006 and February 2013 from Nini Hospital were studied. None of the patients included in the study had travelled recently.

Identification and antibiotic susceptibility

Standard laboratory procedures were used for identification of Enterobacteriaceae and P. aeruginosa, including matrix-assisted laser desorption ionization–time of flight mass spectrometry (MALDITOFMS) for bacterial identification [9]. For A. baumanii, identification was confirmed by real-time PCR of the blaOXA-51 gene and rpoB gene sequencing [10]. The antibiotic susceptibility was assessed by the disc diffusion method and the determination of MICs imipenem, meropenem, and doripenem was performed by using E-test diffusion assay (bioMérieux, Marc l'Etoile, France).

PCR assays and molecular typing

For Enterobacteriaceae, beta-Lactamase-encoding genes (blaTEM, blaCTX-M blaKPC, blaNDM, blaVIM and blaOXA-48) were detected by PCR amplification [11]. for A baumannii, Real-time PCR was done to screen for the presence of blaOXA-23-like, blaOXA-24-like, blaOXA-58-like, and blaOXA-143-like genes [12]. The presence of blaNDM genes was investigated by standard PCR amplification. Sequencing of the entire carbapenem resistance gene was performed. Genotyping was performed by pulsed-field gel electrophoresis (PFGE) using ApaI enzyme and multilocus sequence typing (MLST), in accordance with the Pasteur Institute instructions (http:// www.pasteur.fr/mlst). Moreover, the blaOXA-51-like gene was sequenced and compared to all identified variants. For P. aeruginosa, the molecular detection of carbapenemase-encoding genes, including blaVIM, blaIMP, blaGIM, blaSIM, and blaNDM, was performed using specific primers, as described previously [13]. PCR amplification and sequencing of the oprD gene and over production of the chromosomal cephalosporinase AmpC and efflux pumps (mexA, mexC, mexE, and mexX) were performed as described previously [14].

The outer membrane profiles were analyzed by SDS-PAGE to check for the presence/absence of the oprD gene [15]. Typing of the isolates was done by MLST, as described previously [16].

Results

Enterobacteriaceae

In total, 2767 Enterobacteriaceae isolates were recovered from clinical samples at Nini Hospital, Tripoli, Lebanon, between 2008 and 2012. These isolates mainly belonged to the species E. coli (n=2284, 82.6%), K. pneumoniae (n=230, 8.3%), Enterobacter cloacae (n=10, 0.3%), Enterobacter aerogenes (n=6, 0.2%) and Proteus mirabilis (n=106, 3.8%). Twenty-four non-redundant isolates exhibiting resistance or reduced susceptibility to ertapenem (MIC > 0.25 mg/L) were recovered between 2008 and 2012. The isolates belonged to seven bacterial species and were predominantly collected from urine (n=14) and pus (n=6). The rate of isolates exhibiting reduced susceptibility or resistance to ertapenem increased from 0.4% (n=6/1385) in 2008–10 to 0.9% (n=6/650) in 2011 and 1.6% (n=12/732) in 2012.

In parallel, the faecal carriage of Enterobacteriaceae exhibiting resistance or reduced susceptibility to ertapenem (MIC.0.25 mg/L) was screened in 2012 from samples obtained from 183 healthy children in the community. The children were enrolled in two schools with different socio-economic levels. School 1 (n=120) was a welfare school catering for children of poor families. School 2 (n=87) was a private institution, with pupils that were drawn from upper-class families. Three E. coli isolates exhibiting resistance to ertapenem (n=3/183, 1.5%) were recovered from children (9, 11 and 12 years old) enrolled in three different classes at school 1. PCR and sequencing confirmed the presence of the blaOXA-48 gene in 88% of the clinical isolates (n=21/24) and in the three faecal E. coli isolates from healthy children. No other gene encoding carbapenemase was detected in the isolates, including those devoid of the blaOXA-48 gene (Enterobacter spp., n=3/24). In addition, the ESBL synergy test was positive for eight OXA-48 producing isolates. PCR and sequencing showed the presence of the ESBL-encoding genes blaCTX-M-15 and blaCTX-M-24 in five and three isolates, respectively.

A. baumannii

The four isolates had high-level resistance to carbapenems since the minimum inhibitory concentrations (MICs) for imipenem, meropenem, and doripenem were >32 mg/l. The isolates were also resistant to fluoroquinolones, but remained susceptible to aminoglycosides, doxycycline, tigecycline, rifampin, and colistin. They all carried the blaNDM gene and were negative for the other carbapenem resistance genes tested. Sequencing of the blaNDM gene showed that the variant was the blaNDM-1 gene in all four isolates. PFGE analysis showed that the four isolates shared identical patterns. The MLST analysis showed that all isolates belonged to sequence type 85 (ST85), and sequencing of the blaOXA-51-like gene identified blaOXA-94 as a unique variant.

P. aeruginosa

The imipenem MICs ranged from 16 to 32 μg/ml for all isolates. Eighteen out of 35 isolates were positive by the modified Hodge and EDTA tests and harbored the blaVIM-2 gene (16 isolates) or the blaIMP-15 gene (two isolates). All the isolates had modifications to their oprD gene sequence, including 16 with a stop codon, 10 with an insertion sequence (IS) element, four with mutations, and five in which the gene was not detected. AmpC hyperproduction was observed in eight isolates, and all isolates except isolate 3 showed a high level of expression for at least one efflux pump. SDS-PAGE showed the absence of the OprD protein in the five isolates whose oprD gene was not detected by PCR.

Discussion

The increase in antibiotic resistance among gram-negative bacteria is a notable example of how bacteria can procure, maintain, and express new genetic information that can confer resistance to one or several antibiotics. This genetic plasticity can occur both inter- and intragenerically. Gram-negative bacterial resistance possibly now equals or usurps that of gram-positive bacterial resistance and has prompted calls for similar infection control measures to curb their dissemination [17]. Reports of resistance vary, but a general consensus appears to prevail that quinolone and broad-spectrum-b-lactam resistance is increasing in members of the family Enterobacteriaceae and Acinetobacter spp. and that treatment regimens for the eradication of P. aeruginosa infections are becoming increasingly limited [18]. While the advent of carbapenems in the 1980s heralded a new treatment option for serious bacterial infections, carbapenem resistance can now be observed in Enterobacteriaceae and Acinetobacter spp. and is becoming common place in P. aeruginosa. Gram-negative bacteria have at their disposal a plethora of resistance mechanisms that they can sequester and/or evince, eluding the actions of carbapenems and other beta-lactams. The common form of resistance is either through lack of drug penetration (i.e., outer membrane protein [OMP] mutations and efflux pumps), hyperproduction of an AmpC-type beta-lactamase, and/or carbapenem-hydrolyzing beta-lactamases [19, 20, 21].

In this study, we showed that the rate of Enterobacteriaceae exhibiting a decrease in susceptibility to ertapenem in Nini Hospital, North Lebanon, increased from 0.4% in 2008–10 to 1.6% in 2012. This rise was associated with the emergence of carbapenemase OXA-48, which had been previously reported in Lebanon in 2008–14 [22, 23, 24]. Oxacillinases are also known as class D beta-lactamases and those exhibiting carbapenemase activity are often found in Acinetobacter spp., although there are increasing reports of Enterobacteriaceae, and in particular Klebsiella pneumoniae (K. pneumoniae), possessing class D carbapenemases [25, 26, 27]. The first of the class D beta-lactamases with carbapenemase activity was described in 1995 [3]. Among this class, oxacillinase (OXA-48), which was discovered in a clinical K. pneumoniae isolate in 2004, has been identified mostly in Mediterranean countries, especially Turkey [3, 25]. OXA-48 was the most frequent type of carbapenemase and was often associated with index cases who had been previously hospitalized in North Africa and Turkey [28, 29, 30, 31]. E. coli isolates represented 10% of the OXA-48 clinical producers in 2008–11 and 73% in 2012. In addition, intestinal carriage of OXA-48-producing E. coli was observed in the community and was marked by a diversity of strains, suggesting that OXA-48 has become endemic in North Lebanon. OXA-48 is not a strong carbapenemase and, rather like many carbapenemases evinced in Enterobacteriaceae, relies upon other synergistic mechanisms to mediate resistance against carbapenems (e.g. outer membrane mutations and efflux pumps) [32]. In recent years MBL genes have spread from P. aeruginosa to Enterobacteriaceae, and a clinical scenario appears to be developing that could simulate the global spread of extended-spectrum beta-lactamases. Moreover, given that MBLs will hydrolyze virtually all classes of beta-lactams and that we are several years away from the implementation of a therapeutic inhibitor; their continued spread would be a clinical catastrophe [2].

Antimicrobial resistance among Acinetobacter species has increased substantially in the past decade [33]. Multidrug-resistant Acinetobacter deep wound infections, osteomyelitis, respiratory infections, and bacteremia have been reported among military personnel with traumatic injuries during the conflicts in Iraq and Afghanistan. Current literature suggests that these infections are associated with health care and are acquired by soldiers in medical facilities during the processes of stabilization, emergency treatment, and evacuation through the military medical system [34, 35, 36, 37, 38, 39].

Resistance to carbapenems in A. baumannii is mostly related to the production of carbapenem-hydrolysing class D beta-lactamases and to a lesser extent to metallo-beta-lactamases [40]. The blaNDM-1 and blaNDM-2 genes have been recently identified in A. baumannii [41, 42] and in other Acinetobacter species [43, 44, 45, 46]. This is the first report of carbapenem-resistant A. baumannii carrying the blaNDM-1 gene in Lebanon. However, two NDM-1-producing K. pneumoniae imported from Iraq were detected in 2010 [47].

To date, no NDM-1-producing A. baumannii has been described in Syria; however this is a country where data on the prevalence of A. baumannii antibiotic resistance remain limited. Recently, Hamzeh et al. published a report in which 260 A. baumannii isolates isolated from patients hospitalized in the area of Aleppo were studied [48].

They showed that 66% of the isolates were resistant to carbapenems, but no further molecular epidemiological studies to explore resistance mechanisms were performed. The 99 PFGE analysis showed that the four isolates shared identical patterns. The MLST analysis showed that all isolates belonged to sequence type 85 (ST85), and sequencing of the blaOXA-51-like gene identified blaOXA-94 as a unique variant. Reports of ST85-type strains worldwide are rare. Two A. baumannii belonging to the ST85 clone and carrying the blaNDM-1 gene have recently been described in France. Those strains were isolated from rectal swabs and harboured the blaOXA-94 variant [49].

Carbapenem–resistant P. aeruginosa has become an important problem all over the world challenging the current diagnostic approaches. Carbapenemase genes are one of the most frequent mechanisms reported in carbapenem resistant P. aeruginosa [50, 51, 52, 53, 54].

In our study eighteen out of 35 isolates were positive by the modified Hodge and EDTA tests and harbored the blaVIM-2 gene (16 isolates) or the blaIMP-15 gene (two isolates). All the isolates had modifications to their oprD gene sequence , including 16 with a stop codon, 10 with an insertion sequence (IS) element, four with mutations, and five in which the gene was not detected . Nine strains harbored the IS element ISPa1328 inserted in OprD nucleotide position 419. This IS element was also described in P. aeruginosa in the United States, China, and Japan. This IS can be present in a different OprD location, as described previously. The most common mechanism of resistance to carbapenems in P. aeruginosa is the loss or alteration of the outer membrane porin protein OprD, followed by the production of metallo-beta-lactamases, especially VIM and IMP [55] and by the overexpression of efflux pumps [56].

P. aeruginosa isolates carrying IMP or VIM-type metallo-beta-lactamase have been increasingly reported in hospitals worldwide. The VIM and IMP enzymes are by far the most common MBLs found in carbapenem-resistant bacteria [2], including carbapenem-resistant P. aeruginosa [57]. The predominance of VIM vs. IMP in P. aeruginosa appears to be geographical, with IMP-type MBLs predominating in Asia where it was first discovered and VIM-type enzymes predominating in Europe though both enzymes are now disseminated globally, with VIM-2 in particular well established on five continents [58, 59].

One hundred P. aeruginosa clinical isolates from unrelated inpatients hospitalized at a Turkish university hospital were screened for the presence of blaIMP and blaVIM genes by polymerase chain reaction (PCR). One (1%) isolate was found to carry a VIM-type MBL gene, whereas nine (9%) carried an IMP-1 MBL gene carried on a cassette inserted into a class 1 integron [60].

By far the most common mechanism of resistance to the carbapenems including imipenem in P. aeruginosa is loss or alteration of the outer membrane porin protein OprD [56, 61], the major portal for entry for carbapenems [62]. While not providing the high-level resistance seen in MBL-producers, loss of OprD function is the major determinant of non-MBL-mediated resistance to these agents [56, 61, 63, 64], often seen operating in conjunction with other mechanisms [e.g., derepressed ampC [61, 63] or MexAB-OprM [56, 63, 64]. Indeed, carbapenem resistance resulting from loss of OprD requires the presence of AmpC (inducible or stably derepressed) [65].

Nine of strains harbored the IS element ISPa1328 inserted in OprD nucleotide position 419. This IS element was also described in P. aeruginosa in the United States [66], China [56], and Japan [67].

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Screening for antiretroviral drug resistance among treatment-naive human immunodeficiency virus type 1-infected individuals in Lebanon

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Abstract

Introduction

Antiretroviral therapy (ART) has been successful at decreasing the morbidity and mortality associated with human immunodeficiency virus type 1 (HIV-1) infection. HIV-1 drug resistance (HIVDR) among ART-naive patients has been documented to compromise the success of initial therapy. This study was conducted to determine the prevalence of HIVDR mutations among newly diagnosed drug-naive HIV-infected individuals in Lebanon.

Methodology

Plasma samples from 37 newly diagnosed participants at various stages of HIV-1 infection were used to determine HIV-1 RNA viral load, isolate viral RNA, and amplify DNA by RT-PCR. Purified PCR products were used to perform genotypic resistance tests.

Results

The prevalence of resistance mutations to nucleoside reverse transcriptase inhibitors (NRTI), non-nucleoside reverse transcriptase inhibitors (NNRT), and protease inhibitors (PI) were 5.4%, 10.8%, and 8%, respectively. The major mutations detected in the study participants conferred resistance to NRTIs and NNRTIs recommended for HIV-1 treatment. No significant relationship between HIV-1 viral load of participants and the mode of HIV-1 transmission or between the occurrence of HIVDR and the mode of transmission was found.

Conclusions

To our knowledge, this is the first study on HIVDR mutations among newly diagnosed HIV-infected persons in Lebanon. The overall prevalence of HIVDR mutations detected in our study was 16%. Our results are important for evaluating the utility of the standard first-line regimens in use, determining the feasibility of HIVDR testing before the initiation of ART, as well as minimizing the emergence and transmission of HIVDR.

Key words: HIV-1; ART; resistance mutations; NRTIs; NNRTIs; PIs

Introduction

The use of antiretroviral therapy (ART) has significantly reduced the mortality and morbidity caused by human immunodeficiency virus type-1 (HIV-1) [1]. ART aims at suppressing HIV-1 replication and enhancing immune reconstitution assessed by increased CD4$^+$ T cell counts [2]. By the end of 2011, approximately eight million people living with HIV were receiving antiretroviral therapy in low- and middle-income countries. This represents a 20-fold increase in the number of people receiving therapy in developing countries between 2003 and 2011 [3,4]. There are up to 15 million people estimated to be currently eligible for ART, leading to a treatment gap of 7 million. Despite the increased access to therapy, reports show that the rate of virologic failure among ART recipients is associated with the rate of antiretroviral resistance [5]. Importantly, HIV-1 drug resistance (HIVDR) can be transmitted to ART-naive HIV-infected individuals [6,7]. The International AIDS Society USA guidelines for the use of ART in adults recommend testing for HIVDR prior to initiation of therapy in high-resources countries [8,9].

Resistance to ART is a survival strategy adopted by the virus and precedes the introduction of therapy. Knowledge of ART resistance is described as a predictor of immunologic, virologic, and clinical outcomes of therapy [10]. Consequently, the identification of HIVDR in treatment-naive patients is critical to maximize the detection of transmitted drug resistance, guide the selection of treatment regimen to suppress HIV-1 replication, and ultimately prevent resistance-associated virologic failure [9,11,12]. The prevalence of HIVDR among ART-naive people in the United States and Europe has been estimated to be 10%-15% [11,13]. In sub-Saharan Africa, HIVDR was reported to be less than 5%, with growing evidence of increasing levels of resistance [14,15,16]. In a recent review by Paredes et al. [10], statistics show that the prevalence of primary or pre-existing resistance in high-income countries among treatment-naive HIV-patients is 8%-19% for any drug; 5%-12% for nucleoside reverse transcriptase inhibitors (NRTIs); 2%-8% for non-nucleoside reverse transcriptase inhibitors (NNRTIs); and 3%-7% for protease inhibitors (PIs). Despite the current low rates of HIVDR in resource-limited countries, the authors suggest that an increase is likely to be observed in the years to come, especially due to the high frequency of secondary resistance in many of the resource-limited countries.

The first case of AIDS diagnosed in Lebanon was in a homosexual man in 1984. The use of ART started in the country as early as 1988 with zidovudine monotherapy, followed by the introduction of didanosine in 1991. Towards the end of 1996, a combination of zidovudine, didanosine (later replaced by lamivudine), and indinavir was used. Stavudine was introduced in the late 1990s, and efavirenz was first used in 2000. HIV-infected individuals receive their treatment free of charge from the National AIDS Program (NAP) of the Lebanese Ministry of Public Health (MOPH). Until the end of November 2012, the number of HIV-1 cases reported by the NAP in Lebanon was 1,552 cases, with 540 HIV-infected persons receiving antiretroviral therapy regularly; the latter constituted 35% of HIV-infected persons in the country. The UNAIDS estimates 2,900 people living with HIV-1 in Lebanon with a prevalence rate of HIV/AIDS of 0.1% [17].

In Lebanon and similar resource-limited countries, the management and treatment of HIV-positive individuals are based on the revised WHO recommendations [18]. The treatment protocol followed in Lebanon consists of a NNRTI (efavirenz [EFV] or nevirapine [NVP]) with two NRTIs (lamivudine [3TC], zidovudine [AZT/ZDV], or tenofovir [TDF]) as first-line therapy, and two NRTIs plus one ritonavir-boosted protease inhibitor based regimen (PI) as second-line therapy. The currently available drugs in Lebanon are: five NRTIs (AZT/ZDV, 3TC, TDF, didanosine [ddI], and abacavir [ABC]); two NNRTIs (EFV and NVP); one PI (lopinavir/ritonavir [LPVr]); and one integrase inhibitor (raltegravir [RAL]). The current starting treatment regimen consists of TDF, 3TC, or emitricitabine and EFV. This is the same drug combination prescribed at the time of sample collection. Due to the frequent shortage of drugs, unscheduled treatment interruptions occur. These interruptions have been described to be associated with viral rebound, resulting in pretreatment viral load [19] as well as a possible increased risk of complications [20].

Limited data are available on the prevalence of HIVDR in the WHO Eastern Mediterranean region (EMR). Drug resistance mutations to NRTIs and PIs have been reported in untreated patients in Algeria [21]. Moreover, HIVDR to NRTIs, NNRTIs, and PIs were described in Morocco among ART-naive patients [22]. To our knowledge, there are no data on antiretroviral drug resistance among treatment-naive HIV-1-infected individuals in Lebanon. With increased access to antiretroviral therapy in Lebanon, it is relevant to assess the burden of HIVDR among untreated individuals. Moreover, knowledge of the prevalence of transmitted drug resistance and testing for it in newly presented HIV-infected individuals in Lebanon will help target better care and prevention strategies. The purpose of this study was to determine the prevalence of drug resistance mutations among newly infected ART-naive patients. The generated data will be important for future evaluations of the treatment failure or success following the intake of first-line regimen, and will demonstrate the importance of clinically monitoring resistance for better control of HIV-1.

Methodology

Study participants

Thirty-seven newly diagnosed participants at various stages of HIV-1 infection provided written informed consent upon enrolment in the study (between March 2006 and December 2007). Human subject approval for this study was obtained from the institutional review board of Rizk University Hospital. The study participants were recruited from the Rafic Hariri University Hospital and Rizk Hospital, affiliated with the Lebanese University and the Lebanese American University, respectively. Individuals presenting at the sites to test for recent HIV-1 infection were approached, regardless of the stage of infection. ART-experienced individuals were excluded from the study. HIV-1 seropositivity was confirmed by two positive enzyme-linked immunosorbent assays (ELISAs) and/or a western blot with bands corresponding to at least two of the Gag, Pol, and Env proteins as previously described [23]. A data collection form was administered to volunteers to collect demographic information and data related to risk behavior information.

Clinical and virologic characteristics

Plasma samples were collected from the study participants and stored at -80˚C. These samples were used to determine HIV-1 RNA viral load, which was determined via quantification of HIV-1 viral RNA using COBAS AMPLICOR HIV-1 MONITOR Test version 1.5 (Roche Molecular Diagnostics, Basel, Switzerland) [24,25].

Table 1. Characteristics of participants and viral subtypes

Variable	Number (%)
Gender	
Male	32 (86.5)
Female	5 (13.5)
Age range in years (mean)	21-55 (33)
Viral load copies/ml (range, median)	1,300-111,000,000/66,900
HIV exposure category	
Heterosexual	23 (62)
MSM	9 (24)
IDU	1 (2.7)
Others, Unknown	4 (10.8)
Subtype	
A	4 (11)
CRF-02 AG	4 (11)
CRF-06 cpx	1 (2.7)
CRF-16 AD	1 (2.7)
B	12 (32.4)
C	1 (2.7)
F	1 (2.7)
G	1 (2.7)

HIV-1 drug resistance mutations

HIV-1 genotypic drug-resistance testing was performed at the Rafic Hariri University Hospital Research Laboratories using the FDA-approved ViroSeq HIV-1 genotyping system (Abbott Laboratories, Abbott Park, IL, USA), as per the manufacturer's instructions. Testing was performed on specimens with more than 1000 copies/mL. Briefly, virions from 500 μL of plasma were centrifuged and viral RNA was isolated using QIAamp viral RNA kit (Qiagen, Hilde, Germany) followed by DNA amplification by RT-PCR. PCR products were purified using QIAquick spin PCR purification kit (Qiagen, Hilden, Germany), analyzed by agarose gel electrophoresis, and followed by extension using the ViroSeq HIV-1 genotyping system [26]. Genotypic sequencing using this method generates sequences of the entire protease (codons 1 to 99) and reverse transcriptase (codons 1 to 335) genes. DNA sequencing was performed using ABI Prism 310 Genetic Analyzer (Applied Biosystems, Foster City, CA, USA). Drug resistance mutations were identified based on the published 2009 WHO list for surveillance of transmitted resistance [27,28,29] as well as the Stanford HIV Drug Resistance Database [30].

Statistical analysis

Descriptive statistics were used to examine the prevalence of HIVDR and the characteristics of the study sample. To examine the relationship between viral load and the mode of HIV transmission, the distribution of the viral load among study participants was first examined. The normality of the distribution was then tested using the Shapiro-Wilk test of normality. The modes of transmission among study participants were heterosexual intercourse (n = 23, 62%), homosexual intercourse (n = 9, 24%), and intravenous drug use (n = 1, 2.7%). Data on mode of transmission was not available for four (10.8%) participants. Given that only one subject had intravenous drug use as a mode of transmission, that category was excluded from the analyses. The null hypothesis that the distribution of the viral load is normal (Shapiro-Wilk test showed a statistic of 0.179 and SW significance of 0.000 or a p value < 0.05) was rejected. Consequently, the non-parametric Mann-Whitney test was used to compare viral load by mode of HIV transmission as well as to compare viral load of study participants with or without major NRTI, NNRTI, or PI resistance mutations. The chi-square test was used to examine the relationship between type of HIVDR mutation and mode of transmission. All analyses were conducted using SPSS version 17.0. $p < 0.05$ was used as the significance level.

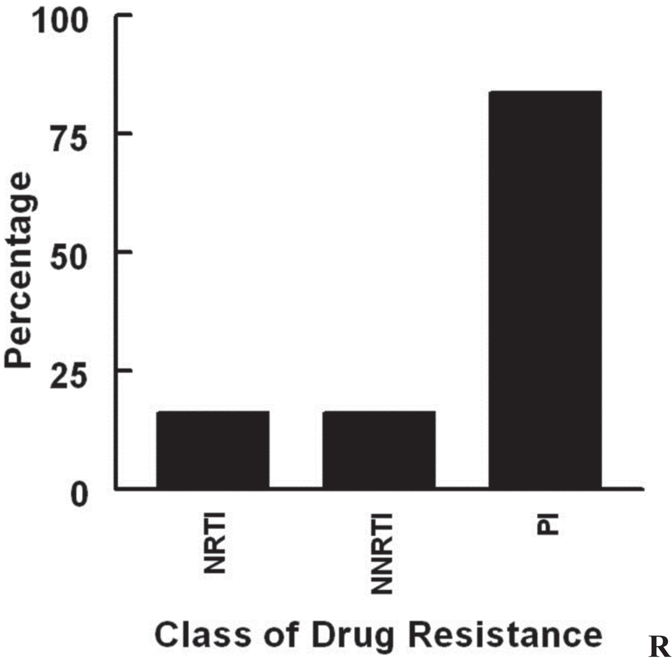

Figure 1. The distribution of drug class resistance among ART-naive subjects. HIV-1 genotypic drug resistance testing was performed on plasma samples from 37 treatment-naive HIV-1 infected subjects. The percentage of major and other NRTI, NNRTI, and PI resistance mutations are plotted. X-axis: class of drug resistance; Y-axis: percentage of patients with a class of a drug resistance.

Results

Characteristics of the study participants

A total of 37 HIV-1 infected patients were enrolled in the study. Table 1 summarizes the demographic, virologic, and immunological characteristics of the study participants. These participants were newly diagnosed and ART-naive. Overall, 86.5% (n = 32) were males and 13.5% (n = 5) were females. The average age was 33.5 for males and 32 years for females. Importantly, the majority of participants (78%) included in this study were ≥ 25 years of age. The modes of HIV-1 transmission among the study participants were heterosexual intercourse (n = 23, 62%), homosexual intercourse (n = 9, 24%), and intravenous drug use (n = 1, 2.7%). Data on the mode of transmission was not available for 10.8% (n = 4) of the participants. The date of infection of the study participants was not known. A total of 37.8% (14/37) of the study participants reported travelling to the Gulf, West Africa, and the United States, whereas 27% (10/37) reported no travel history. Fifty percent (n = 5) of those with no travel history were heterosexuals, 40% (n = 4) were homosexuals, and 10% (n = 1) were intravenous drug users. Twenty-seven percent of enrolled participants did not report travelling outside Lebanon. All participants reporting travel history were males, and 8% (3/37) were females with a partner travelling to West Africa. The participants were infected with the following subtypes: HIV-1A (n = 4, 11%), HIV-1B (n = 12, 32%), HIV-1C (n = 1, 2.7%), CRF02_AG (n = 4, 11%), and 4 patients separately infected with HIV-1F (2.7%), HIV-1G (2.7%), CRF-06cpx (2.7%), and CRF-16AD (2.7%). Thirty-two percent of ART-naive participants were not sub-typed. HIV-1B subtype was predominant among the study participants.

Drug resistance mutations among the study participants

HIV drug resistance was evaluated on samples from 37 participants. Figure 1 shows the distribution of classes of mutations; PI resistance was the most frequently observed among ART-naive HIV-1 infected patients (83.7%, n = 31). NRTI and NNRTI mutations were each detected in 16% (n = 6) of the study participants. The reported mutations included major, minor, and other mutations (Table 2). Table 3 summarizes the major resistance mutations detected among the study participants as reported by the Stanford HIV Drug Resistance Database along with the level of resistance to corresponding drugs. The following NRTIs were detected in the respective number of study participants: G333D/E (n = 1), V179E (n = 1), V179I (n = 1), T69D (n = 1), Y115F (n = 1), V118I (n = 2), K219E (n = 2), V75M (n = 1), M184I (n = 1), T215S (n = 1), and A62V (n = 1). Among the thymidine analogues mutations (TAM) described in the literature [31,32], K219E was detected in two study participants. T69D, V75M, Y115F, M184I, T215S, and K219E have been reported by the updated list of drug resistance mutations [27] and are all known as major mutations, except for V75M (Table 3). T69D causes low level resistance to ddI and potential low-level resistance to stavudine (d4T) [33] and, according to Paredes et al. [10], it confers multi-NRTI resistance.

M184I is also a signature mutation for 3TC and emtricitabine (FTC), with moderate impact on resistance to ABC and ddI [34]. It has also been reported to generate hypersensitivity to and synergy with ZDV, TDF, and d4T [10], and to decrease viral replication fitness [30]. Additional NRTI-selected mutations reported by the HIV drug resistance database [30] and detected in this study include V75M conferring resistance to ddI and d4T, and V118I, the latter being a minor mutation. T215S is associated with resistance to thymidine analogues and specifically to ZDV and d4T. Y115F is associated with high-level phenotypic or clinical resistance to ABC but moderate resistance level to TDF. Finally, K219E, also a thymidine analog mutation, confers moderate phenotypic and clinical resistance to ZDV and d4T. K103N, conferring resistance to NVP and EFV [35], was not detected in any of the ART-naive patients.

Y181I, Y188H, and L100I were major NNRTI mutations (Table 3) detected in two, one, and one patients, respectively. V179E (n = 1), V108I (n = 1), and F227L (n = 1) (Table 2) were also detected in this study and are on the surveillance list of drug resistance [27] but are not described as major mutations. K103N and Y181C, conferring cross-resistance to all NNRTIs, were not detected in the study group.

Among the detected PI resistance mutations, M36I was predominantly observed in 51% (n = 19) of the ART-naive participants, followed by R41K (n = 14, 38%), I13V (n = 12, 32%), H69K (n = 11, 30%), L89M (n = 9, 24%), L63P (n = 9, 24%), and K20R (n = 7, 19%). Other mutations were detected in £ 16% of participants (Table 2). M36I, L63P, K20R, and V77I are highly polymorphic compensatory mutations and were all detected in the study participants (Table 2) [27]. M36I, described as a polymorphic substitution in subtype F and other non-B HIV proteases, has been suggested to lead to early development of drug resistance in individuals infected with non-B subtypes of HIV. The study participants harboring the M36I mutation did not show a particular predominance of any HIV-1 subtype (subtype A, n = 4; subtype B, n = 3; subtype CRF-02AG, n = 4; subtype CRF-02AD, n = 1). R41K, H69K, L89M, and I15V were reported to be more frequent in subtype C [25,36]. In this study, one patient was infected with HIV-1C harboring R41K, H69K, and I15V. V32I, I50L, and L90M were each detected in one patient (Tables 2 and 3) and have been reported as major mutations by the Stanford HIV Drug Resistance Database and by the updated surveillance list of drug resistance mutations [27,30]. L90M, a signature mutation, induces significant phenotypic or clinical resistance to NFV and significantly contributes to saquinavir (SQVr, ritonavir-boosted) as well as decreased susceptibility to most other PIs, specifically NFV [10]. I50L has been reported to induce significant phenotypic or clinical resistance to ATVr, whereas V32I is known to contribute to high resistance to ATVr, DRVr, FPVr, IDVr, LPVr, and TPVr.

Table 2. The prevalence of NRTI, NNRTI, and PI resistance mutations among the study participants

Mutation	Number (%)
NRTI	
G33D/E	1 (0.03)
V179E	1 (0.03)
V179I	1 (0.03)
T69D	1 (0.03)
Y115F	1 (0.03)
V118I	2 (0.05)
K219E	2 (0.05)
V75M	1 (0.03)
M184I	1 (0.03)
T215S	1 (0.03)
A62V	1 (0.03)
NNRTI	
Y181I	2 (0.05)
V179E	1 (0.03)
Y188H	1 (0.03)
L100I	1 (0.03)
V108I	1 (0.03)
F227L	1 (0.03)
PI	
M36I	19 (51)
R41K	14 (38)
I13V	12 (32)
H69K	11 (30)
L89M	9 (24)
L63P	9 (24)
K20R	7 (19)
G16E	6 (16)
K20I	5 (14)
E35D	5 (14)
I62V	4 (11)
L10I	4 (11)
L10F	3 (8)
I15V	3 (8)
L89I	2 (5)
A71T	2 (5)
V77I	2 (5)
L10V	2 (5)
D60E	2 (5)
I50L	1 (3)
I15L	1 (3)
V321	1 (3)
L33V	1 (3)
I74V	1 (3)
L89K	1 (3)
M36L	1 (3)
L33F	1 (3)
L90M	1 (3)

Other resistance mutations (L89I, L10I, and L10V) were detected in this study, though in less than 10% of the study participants. These minor PI resistance mutations are associated with resistance to most PIs when detected concurrently with other mutations [37,38]. Moreover, several other mutations in the protease gene were detected. These were either polymorphic or non-polymorphic with established resistance (e.g. F227L, V118I). Although these mutations may have limited effect on susceptibility to antiretroviral drugs, they have been associated with high viral fitness; in addition, it has been suggested that pre-existing accessory mutations lead to faster emergence of PI-resistant viruses [39]. The PI-selected accessory polymorphic mutations D60E, V77I, and I62V were also detected in addition to I13V, a non-polymorphic mutation (Table 2) [40].

Drug resistance mutations and relationship with HIV-1 transmission and viral load

Five out of the six participants harboring major drug resistance mutations (Table 3) were heterosexuals and one was homosexual. The latter did not report on travel outside Lebanon, whereas the former either reported travel (4/5) or had a partner who travelled to West Africa (1/5).

Dual- (NRTI, NNRTI) and triple-class resistance mutations (Table 3) were each detected in one participant. Among the participants, five (13.5%) ART-naive patients did not show any drug resistance mutations and had a lower average viral load as compared to those showing NRTI, NNRTI, or PI mutations. Viral load was high in most study participants, consistent with the lack of ART. No significant difference in the viral load of study participants with major NRTI, NNRTI, or PI drug resistance mutations was found as compared to those without them (p = 0.099, p = -0.345, and p = 0.54, respectively). When looking at the mode of transmission and the type of HIVDR detected (major or not), 8.7% with major NRTI mutations were heterosexuals versus 0% homosexuals; 13% of study participants with NNRTI major mutations were heterosexuals, whereas 11% were homosexuals. Finally, 13% with PI major mutations were heterosexuals and none were homosexuals. When comparing the viral load by mode of transmission, the data showed no significant difference between homosexuals and heterosexuals in the study group. Moreover, there was no significant difference in the occurrence of these mutations among heterosexuals and homosexuals.

Table 3. Major drug resistance mutations detected in ART-naive subjects

Sample ID	VL copies/ml	Major mutations	Resistance profile	
			High level	Moderate level
		NRTIs		
33	111,000,000	T69D	ABC, ddI, TDF, d4T, ZDV	3TC, FTC
		Y115F	ABC	TDF
		K219E		d4T, ZDV
34	283,000	V75M	ddI, d4T	
		M184I	3TC, FTC	ABC, ddI
		T215S		
		K219E		d4T, ZDV
		NNRTIs		
1	43,400	Y181I	NVP, ETR, RPV	
2	279,000	Y181I	NVP, ETR, RPV	
33	111,000,000	Y188H	NVP	EFV
34	283,000	L100I	EFV, ETR, RPV	NVP
		PIs		
16	4,660	V32I	FPV	ATVr, DRVr, IDVr, LPVr, TPVr
33	111,000,000	I50L	ATVr	
36	315,000	L90M	NFV	SQVr

This table includes a list of ART-naive study participants with detected major drug resistance mutations and the impact of these mutations on the resistance profile to the respective drugs. The HIV-1 viral load of these participants upon enrolment in the study ranged between 4,660 and 111,000,000 copies/mL of plasma.

Abbreviations. NRTIs: 3TC, lamiduvine; ABC, abacavir; ddI, didanosine; d4T, stavudine; FTC, emtricitabine; TDF, tenofovir; ZDV, zidovudine. **NNRTIs**: EFV, efavirenz; ETR, etravirine; NVP, nevirapine; RPV, rilpivirine. **PIs:** ATV, atazanavir; DRV, darunavir; FPV, fosamprenavir; IDV, indinavir; LPV, lopinavir; NFV, neflinavir; SQV, saquinavir; TPV, tipranavir; r, ritonavir-boosted

Discussion

HIV-infected persons with evidence of HIVDR are known to begin ART with a higher risk of virologic failure, as well as an increased risk of developing resistance to drugs that could have been active [5,10]. These findings resulted in the new guidelines recommending the performance of genotypic resistance testing in therapy-naive patients before the initiation of first-line regimens [9]. The lack of laboratory monitoring of drug resistance in low-income countries is a serious challenge to the management of HIV-infected patients. To our knowledge, this is the first report investigating drug resistance among HIV-infected individuals in Lebanon. The current starting regimen of HIV-1 treatment in Lebanon consists of TDF, 3TC (or emitricitabine) and EFV. The major resistance mutations detected in our study participants are associated with a response failure to all the NRTIs available in Lebanon. NVP and EFV are the NNRTIs available in Lebanon. The NNRTIs resistance mutations detected in our study (albeit in four ART-naive persons) confer a low-level resistance to NVP and EFV (as is the case with Y181I and Y188H), whereas L100I leads to high level of phenotypic and clinical resistance to EFV and contributes to NVP resistance. Hence, first-line NNRTIs available in Lebanon will fail at controlling HIV-1 infection among these participants. M46I, known as a stable mutation hampering PI-based antiretroviral regimens [41], was not detected in any of our study participants; moreover, L90M, a frequently reported mutation, was detected in one patient. Our results indicate that the use of recommended treatment regimen will fail at controlling HIV-1 among the study participants as indicated by the type of detected HIVDR mutations.

The WHO classifies the prevalence of HIVDR among treatment-naive individuals into three classes: low, < 5%; moderate, 5%-15%; and high, > 15% [42]. Our study reveals an overall HIVDR prevalence of 16%. According to the WHO guidelines, this prevalence is classified as high. The prevalence of the NRTI, NNRT, and PI resistance mutations were 5.4%, 10.8%, and 8%, respectively. These results are comparable with the values reported in high-income countries [10]. Consequently, it is expected that therapy with any of the recommended and available drugs in Lebanon is doomed to failure. Reports show a tenfold increase in the number of people receiving ART in low- and middle-income countries [43]. With the scaling-up of antiretroviral therapy, the establishment of control strategies for surveillance and prevention of emergence of resistance is a high priority. In the absence of adequate monitoring, the increased access to ART might lead to spread of transmitted and acquired drug-resistant HIV-1, resulting in reduced effectiveness of these drugs. Drug-resistant viruses have been reported to become the major circulating virus populations in infected individuals, with subsequent failure of therapy in treatment-naive patients [12,44,45,46].

Even though the number of participants included in this study is small, it is worrisome to detect this high prevalence of resistance mutations, especially to the available treatment combination in Lebanon. An important limitation of this study is that we could not determine the stage of the disease nor draw any correlations between $CD4^+$ T cell count and drug resistance due to lack of access to clinical data of participants. Nevertheless, this alarmingly high resistance might have been the result of the transmission of drug-resistant viruses from partners infected with the resistant virus or selection as a result of undisclosed use of ART, especially among those cases with dual or triple resistance mutations. The prevention of the transmission of HIV drug resistance should be a national priority.

Conclusions

Our study reveals a high prevalence of resistance mutations among our study participants, conferring resistance to the recommended and available drugs in Lebanon. More studies are needed to further evaluate this reported rate of drug resistance and its impact on the failure of current drug regimens as well as transmission of drug-resistant strains in Lebanon. With the scaling-up of antiretroviral therapy, the establishment of control strategies for surveillance and prevention of resistance emergence is a high priority.

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Hepatitis A Virus in the Middle East and North Africa (MENA) Region and the Case of Lebanon

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Abstract

During the past three decades, a gradual shift in the age of infection with hepatitis A virus (HAV) from early childhood to adulthood has been observed. There is a general lack of updated data on HAV burden of disease, incidence and age-specific seroprevalence in countries of the Middle East and North Africa (MENA) region. The aim of this article is to review the published data on anti-HAV seroprevalence, an important tool to monitor infections rates, in countries of the MENA region and associated risk factors including water and socioeconomic data when available. Data on anti-HAV seroprevaleve were found for 12 out of 25 MENA countries. We show that MENA countries, similar to other areas in the world, have a clear shift in HAV incidence with a decline among young age groups and an increase among adults and older individuals. This would likely be associated with increased morbidity and increased risks of outbreaks among younger age groups. Consequently, the continuous surveillance of hepatitis A cases and the inclusion of hepatitis A vaccine in the expanded immunization programs are needed in countries of the MENA.

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Introduction

It is estimated that approximately 1.4 million new cases of hepatitis A virus (HAV) infections occur worldwide each year with 11-22% requiring hospitalization [1]. Hepatitis A is transmitted from person-to-person and through contaminated food and water. The severity and the clinical course of HAV infection are strongly related to the age at infection. In early childhood, infection is mainly asymptomatic. The risk of developing symptomatic HAV infection increases with age, which might lead to acute liver failure and death although in rare occasions [2] with mortality rates reaching 1.8% among those over 60 years of age. Moreover, HAV incidence rate is strongly associated with socioeconomic indicators and access to safe drinking water whereby an income increase and increased access to clean water leads to a decrease in HAV incidence [2].

The continuous assessment of anti-HAV seroprevalence, is used as a tool to monitor infection rates in a population. During the past three decades a gradual shift in the age of infection in many of the developing countries from early childhood to adulthood has been observed [2, 3]. This shift, referred to as epidemiological shift, has been mainly attributed to improved socioeconomic status, sanitary conditions, access to improved water sources, improvements in quality of water and improvements in sewage treatment methods in the case of reusable water [4]. These improvements result in growing cohorts of susceptible young people; hence increasing the risk of HAV outbreaks. Consequently, an increase in the management costs of HAV infection cases is likely to occur to include treatment and prophylactic vaccination [5]. The changing epidemiology of HAV and the need for increased attention towards HAV prevention were highlighted in a global meeting gathering a large number of experts from 46 countries [6]. Experts have again confirmed the shift towards lower endemicity among young children and increased susceptibility of adolescents and adults.

There is a general lack of updated data on HAV burden of disease, incidence and age-specific seroprevalence in countries of the Middle East and North Africa (MENA) region. The aim of this article is to review the published data on anti-HAV seroprevalence in the MENA countries and associated risk factors including water and socioeconomic data when available. The advanced conclusions will provide insight to the need of a vaccination policy for the control of HAV infection in these countries along with continuous surveillance for better documentation of the burden of disease.

Materials and Methods

The MENA region includes 25 countries (Algeria, Bahrain, Cyprus, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, Turkey, UAE and Yemen) and cover a population of over 380 million people. We performed a systematic PubMed search to identify published studies on anti-HAV seroprevalence in these countries during the past decade. A study was included if it contains seroprevalence data for a specific population in any of the MENA countries. Age-specific seroprevalence data were extracted from each published study and grouped by year of study and corresponding region/country where the study was performed. Studies including HAV-vaccinated individuals were not included. Similarly, a Google scholar and PubMed search were done for waste water treatment in countries of the MENA region. The keywords used included: “desalination”, “desalination capacity”, “sewage treatment” and “wastewater treatment” along with the name of the country.

Results

Seroprevalence data in the MENA region

Table 1 represents a detailed summary of reported HAV seroprevalence in countries of the MENA across age groups during the past decade. A large number of studies have been reported mainly from Turkey and Iran. The overall prevalence rate reported in different provinces of Turkey during the past 10 years among young adults (≤19 years old) ranges between 13% and 64% [7-19]. An increasing trend was observed up till 2008 (29% up to 63.8%) followed by a sharp decline observed in 2010 and 2012 (13 % and 29.5%, respectively).

In Iran, the overall population based anti-HAV seroprevalences were reported to be 83% [20] and 90% [21] across all age groups. Increasing seroprevalence rates with age across years were specifically observed in Tehran [22, 23]. 61.6 % and 86% were reported among age groups ≤ 20 and 18-65 years old, respectively. Variable seroprevalence rates were reported in different regions of Iran; seroprevalence rates of 64% and 68% were reported in the Northern area among young adults of 15-25 and 18- 30 years, respectively [24, 25] as compared to less than 10% anti-HAV antibodies rates among children of 0-7 years old. It is notable that as low as 3.9% seroprevalence rates were reported in central Iran among children and adolescents (1-15 years) as compared to 79% in Southern Iran [26, 27].

In 2007, the Ministry of Health in Saudi Arabia reported viral hepatitis as the second most common viral disease in the country with HAV contributing to 16% following HBV (52%) and HCV (32%) [28]. Similar to Iran and Turkey, HAV seroprevalence data from Saudi Arabia have shown variations in anti-HAV antibodies in different regions [28-33]. A marked decrease in the prevalence of HAV has been reported in 2008 (18.6%) among Saudi children and adolescents [30] as compared to 52% and 25 % reported in 1989 and 1997, respectively. Similarly, Memish et al [34] recently reported the results of eight years of viral hepatitis surveillance (2000-2007) with average annual anti-HAV seroposotivity declining by 30% across years. When results were stratified by age, authors reported that HAV incidence decreased by 42% among those aged <15 years and increased by 61% in those ≥15 years.

A small number of studies on HAV seropeidemioloy and/or seroprevalence were reported by other MENA countries. A single report from Aden, Yemen revealed an overall seroprevalence of 86.6% with non-significant differences by gender, educational and occupational status [35]. In Egypt, the seroprevalence of anti-HAV antibodies among children (3-18 years) of low socioeconomic status was found to be significantly higher than that of children of high socioeconomic status (90% versus 50%), respectively, with water supply and sewage disposal reported as the most significant risk factors [36]. The overall seroprevalence of HAV reported in Tunisia decreased to 85.9% as compared to 94.9% reported in 2000 in age groups ranging between 18 and 30 years old [37]. This study highlighted the susceptibility of adolescents and young adults to HAV. Authors reported prevalence rates of 91.9% and 80.6% in 2000 and 2007, respectively among 18-20 years old versus seropreavalence rates of 99% and 92% in adults above 26 years old. Recently, anti-HAV antibodies were detected in 19.75% of patients with clinical symptoms of viral hepatitis with 38% clustering among children under 6 years, 20% among 6-15 years and 42% from patients over 15 years old [38]. A study held among healthy Kuwaiti adults (applying for a new job and those recruited for military service), reported 71% of cases being not immune to HAV [39]. Single studies were reported from the United Arab Emirates (UAE) [40], Algeria [41], Iraq [42] and Morocco [43] in children and young adults. These studies show again the rise in seroprevalence with age leaving younger age groups with higher susceptibility to HAV infection (Table 1).

Table 1. anti-HAV seroprevalence in MENA region during the past 10 years (2004-2013)

Country	Seropositivity (%)	Age	Overall-pop based		Area and year of study	Reference
Algeria	7.1% 18.9% 23.7%	<2 2-5 6-8	12.3%	(0.75-8)	Tlemcen (north-west Algeria) 2006	Smahi *et al.* (2009)[41]
Egypt	64.3% 85.3% 90.3% 90.0%	<6 6-10 11-15 >15	86.2%	(3-18)	Cairo 2003-2004	Salama *et al.* (2007)[36]
Iran			83%	(6+)	Isfahan 2006	Ataei *et al.* (2008)[20]
			90%	(1-83)	Tehran Pop-based study 2006-2007	Mohebbi *et al.* (2012)[21]
	79.3% 91.3% 99%	0-<20 20-30 >30	88.2%	(0- >30)	Fars province southern Iran 2008-2009	Taghavi *et al.* (2011)[27]
	8.4% 15.8% 64.3%	1-5 5-15 15-25	38.9%	(1-25)	Northern province (Sari) 2007	Alian *et al.* (2011)[24]
	61.5% 51.7% 52.9% 65.2% 85%	1.5-1.9 2-5.9 6-10.9 11-15.9 16-20	61.6%	(0.5-20)	Tehran 2009	Sofian *et al.* (2010)[23]
	85%	18-65	86%	(18-65)	Tehran 2006	Merat *et al.* (2010)[22]
	99%	18-65			Golestan 2006	
	96%	18-65			Hormozgan 2006	
	5.7% 9% 20.4% 34.8% 68.4%	1-2.9 3-6.9 7-10.9 11-17.5 18-30	19.2%	(0-30)	Mazandaran, North Iran 2010	Saffar *et al.* (2012)[25]
	3.9%	1-15	3.9%	(1-15)	Kashan	Taghavi Ardakani *et al.* (2013)[26]
Iraq	91.3% 96.8% 97.9% 97.4% 98%	1-10 11-20 21-30 31-40 ≥41	96.4%		Nationwide 2005-2006	Ataallah *et al.* (2011)[42]
Kuwait	24% 51% 26%	<27 28-40 41-60	28.62%	(<60)	Nationwide 2003-2004	Alkhalidi *et al.* (2009)[39]

Country	Seropositivity (%)	Age	Overall-pop based		Area and year of study	Reference
Morocco	33.3% 49.4% 70.3%	<2 2-6 >6	51%		Marrakech 2005-2006	Bouskraoui *et al.* (2009)[43]
Saudi Arabia	56% 81% 87% 86%	20-29 30-39 40-49 50-69			Riyadh 2001-2005	Almuneef *et al.* (2006)[29]
	14.8% 38.1% 28.6%	4-6 7-11 12-14	28.7%	(4-14)	Jeddah 2004	Jaber (2006)[31]
	7.1% 14.5% 30.6% 52%	4-7 8-11 12-15 16-18	28.9%		Nationwide 2005	Almuneef *et al.* (2006)[29]
			18.6%	(16-18)	Madinah, Qaseem & Qaseer 2007-2008	Al Faleh *et al.* (2008)[30]
	8.9% 33.6% 44.1%	1-3 3-5 5-7	33.8%	(1-7)	Northern border region	El-Gilany *et al.* (2010)[33]
	81.9% 18.1%	<15 ≥ 15	7%		Central, Eastern and Western regions of Saudi Arabia 2000-2007	Memish *et al.* (2010)[34]
Tunisia	44.2% 58.9% 83%	5-9 10-15 >15	60%	(5.7-23)	Sousse 2002	Letaief *et al.* (2005)[89]
	83.9% 90.5% 91.7%	5-10 11-16 17-25			North-eastern cities South Tunisia	Rezig *et al.* (2008)[90]
	80.6% 84.9% 92.1%	18-20 21-25 26-30	85.9%	(18-30)	South Tunisia 2007	Louati *et al.* (2009)[37]
	38% 20% 42%	<6 6-15 >15	19.75%	(1-60)	Nationwide, 2006-2008	Gharbi-Khelifi *et al.* (2012)[38]
Turkey	>80% >90%	5-9 14+	64.4%	(0-91)	Southeastern Anatolia 2005-2006	Ceyhan *et al.* (2008)[7]
	44% <80%	5-9 <25			Marmara 2005-2006	
	36% <80%	5-9 <25			Aegean 2005-2006	
	34% >72% <80%	5-9 40-60 <60			Central Anatolia 2005-2006	
	22.8% 79% 76.8%	0.5-5 6-12 13.17	63.8%	(0.5-17)	Duzce Province- Black sea 2003	Kaya *et al.* (2008)[8]

Country	**Seropositivity (%)**	**Age**	**Overall-pop based**		**Area and year of study**	**Reference**
	35.5% 19.2% 74.3% 83% 92.8%	6-23 months 2-5 6-10 11-14 15-18	57.2%	(0.5-18)	Kahramanmaras Province-Mediterranean region 2005	Kaya *et al.* (2007)[9]
	18.1% 53.2% 66.9%	1-5 6-10 11-15			Istanbul province-Marmara 2003	Soysal *et al.* (2007)[10]
	33.3% 46.4% 45% 79.2%	1-4 5-9 10-14 15-18	51.9%	(1-18)	Izmir province-Aegean region	Egemen *et al.* (2006)[11]
			64%	(17-27)	Aydin Province-Aegean region 2003-2004	Oncu *et al.* (2005)[12]
	41.8% 46.7%	2-6 7-15			Duzce Province-Duzce	Sencan *et al.* (2004)[13]
	63.9% 71.9%	2-6 7-15			Duzce Province -Golayaka	
	47.8% 23.7% 43.4% 52.4% 76.6%	06-23 month 2-6 7-10 11-14 15-17	44.6%	(0.5-17)	Manisa Province-Aegean Region 2000-2001	Tosun *et al.* (2004)[14]
	0% 4.4% 25% 37.3% 43.2%	7-23 months 2-5 6-10 11-14 15-19	29.3%	(0-19)	Erdine Province-Marmara region	Erdogan *et al.* (2004)[15]
			13.1%	(1-16)	Eastern Anatolia 2010	Deveci *et al.* (2011)[19]
	21.4% 15.5% 20.1% 32.6% 44.3% 52.4%	1-2 2.1-5 5.1-8 8.1-11 11.1-14 14.1-18	29.5%	(1-18)	Izmir province 2009	Haliciglu *et al.* (2012)[16]
	11.4% 29% 49.7% 69%	5-9 10-14 15-19 20-25	40%	(5-25)	Istanbul	Ceran *et al.* (2012)[17]
			23.5%	(12 month)	Ankara 2007-2009	Ince *et al.* (2011)[18]
United Arab Emirates	10.2% 31.5%	1-6 6-12	20.1%	(16.4-24.6)	Abu Dhabi 2004-2005	Sharar *et al.* (2008)[14]
Yemen			86.5%	(18.2-19.4)	Aden	Bawazir *et al.* (2010)[35]

Access to improved water sources/sanitation facilities, waste water treatment and desalination

Table 2 includes the percentage of the population with access to improved drinking water sources and sanitation facilities in the MENA region as per the UNICEF's update [44]. Numerous countries in the MENA region have a high percentage of their population receiving improved drinking water with few countries providing improved drinking water to 100% of the population. Similar trends are observed in these countries as related to the utilization of improved sanitation facilities. However, some of the poorer countries such as Mauritania and Somalia are lagging behind with less than 30% of the populations having access to improved drinking water and using improved sanitation facilities.

Results on the quality of drinking/agricultural water are reflected in table 3 where data on wastewater treatment and desalination statuses of countries of the MENA region are summarized. There are 3 main types of wastewater treatment: a primary treatment which involves the physical removal of organic and inorganic solids with 50-70% efficiency [45]; the other two types are referred to as secondary and tertiary treatments and they involve further removal of suspended solids through controlled aerobic processes, and further treatment such as the use of filters, membranes and disinfectants, respectively [45, 46]. The enhanced removal of solids in the secondary treatment processes and the additional tertiary treatment reduces the presence of viruses in water [45, 47]. 12 out of the 25 countries in the region fully or partially utilize tertiary level wastewater treatment. In Kuwait and the UAE [48], all waste water undergoes tertiary and advanced treatment; whereas in Saudi Arabia, Oman and Jordan some wastewater treatment plants only reach the secondary level while others are at the tertiary level [48]. Morocco [48], Algeria [49], Lebanon [48], Yemen [48], Syria [48)], Tunisia [50] and Israel [51] have developed their waste water treatment plants to the secondary levels with Tunisia and Israel currently investing in the advancement to tertiary level treatment. Countries utilizing both primary and secondary treatment plants (depending on location) include Egypt [48], Libya [52], Palestine [48] and Mauritania [53]. Turkey [48], Iran [54], Bahrain [55] and Cyprus [56] currently have treatment plants functioning at the three different levels.

Table 2. National use of improved drinking water sources/sanitation facilities in the MENA region (2010)

Country	2010 National use of improved drinking water sources (percentage of population)	2010 National use of improved sanitation facilities (percentage of population)
Algeria	83	95
Bahrain	100*	100*
Cyprus	100	100
Djibouti	88	50
Egypt	99	95
Iran	96	100
Iraq	79	73
Israel	100	100
Jordan	97	98
Kuwait	99	100
Lebanon	100	98**
Libya	54**	97
Mauritania	23	26
Morocco	83	70
Oman	89	99
Palestine	85	92
Qatar	100	100
Saudi Arabia	89***	100*
Somalia	29	23
Sudan	58	26
Syria	90	95
Tunisia	90**	81**
Turkey	100	90
UAE	100	98
Yemen	55	53

* Data from urban areas only. ** Data from 2000. *** Data from 1990. Source: http://www.unicef.org/media/files/JMPreport2012.pdf

Table 3 summarizes the demographic characteristics of voluntary participants enrolled in a seeroprevalence study performed in Lebanon (n=283). The majority of our study participants were males. 48% of these participants were 19-29 years old and 36% being holders of a university degree. Moreover, the majority of the study participants lived in non-crowded settings. Our study does not include children and young adults less than 19 years old. Moreover, data were not collected on vaccination status of the study participants. The overall prevalence of anti-HAV among our study participants was 72%. The anti-HAV seropositivity rate within age groups 19-29, 30-39, 40-49 and 50-59 gradually or steadily increased from lower age group (60%, 19-29 years old or young adults) to older age group (91%, 50-59 years old). Accordingly, 40% of our tested young adults aged 19-29 years were anti-HAV negative as compared to 23%, 6% and 9% for age groups 30-39, 40-49 and 50-59, respectively (Figure 1). Our seroprevalence data reveal that younger Lebanese adults are more at risk of acquiring hepatitis A virus infection as compared to older age groups. This results in an increased susceptibility to HAV infection at younger age which will consequently increase the likelihood of HAV outbreaks among the young Lebanese adults[57]. Moreover, the Epidemiologic Surveillance Unit at the Ministry of Public Health (MOPH) collects data on hepatitis A virus cases from different regions of Lebanon. Table 3 includes the number of HAV infections in the following age groups: 0-4, 5-9, 10-19, 20-39, 40-59 and ≥60 years old. The total number of acute cases reported by the ESU during 2001-2014 was 7501 cases. These reports were used to assess the epidemiology of hepatitis A by age at the national level. The largest number of reported hepatitis A cases is clustered among children and adolescents between 5-9 and 10-19 years during 2001-2014 (Table 4). The national data reflect as well the change in the epidemiology of HAV infections across time where younger age groups, specifically 0-9 years, are becoming more susceptible to HAV infection across time in Lebanon as compared to adults aged 10-39 years. This again suggests the epidemiologic shift in age-specific HAV infection [57].

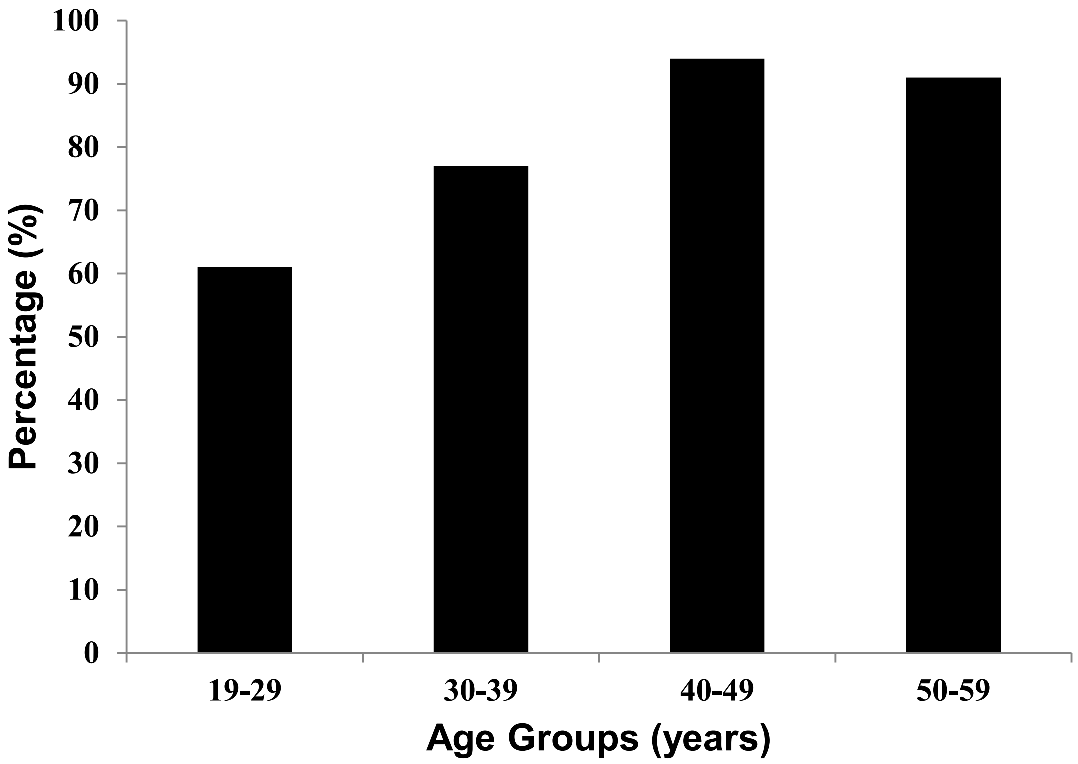
Table 3. Demographic characteristics of the study participants

	Number N=283	Percentage
Gender		
Male	221	78.0
Female	62	21.9
Age		
19-29	137	48.4
30-39	75	26.5
40-49	48	16.9
50-59	23	8
Education		
Illiterate	9	3.2
Primary School	30	10.5
Secondary School	80	28.1
High School	63	22.2
University Level	101	35.7

Table 4. Number of Hepatitis A cases by age in Lebanon, 2001-2014

	Age (Years)						
Year	**0-4**	**5-9**	**10-19**	**20-39**	**40-59**	**60+**	**Total**
2001	43	119	82	25	1	4	274
2002	42	96	105	51	3	4	301
2003	79	214	181	81	4	5	564
2004	51	112	127	74	8	2	374
2005	33	54	62	31	3	5	188
2006	24	83	115	60	7	2	291
2007	65	151	209	98	8	3	534
2008	85	190	219	120	9	2	625
2009	66	156	293	168	13	3	699
2010	33	85	101	88	8	3	318
2011	48	130	172	83	7	1	441
2012	125	188	266	144	17	4	744
2013	161	360	592	357	35	6	1511
2014	60	146	261	157	10	3	637
Total	915	2084	2785	1537	133	47	7501

Figure 1. The percentage of anti-HAV antibodies in sera of the study participants (n=283)



Discussion

Endemicity of HAV is ranked as high, intermediate or low in different geographic areas. The level of endemicity correlates with sanitary and hygienic conditions [58]; consequently these are considered clear indicators of the infrastructure of a country. HAV Infection is acquired early during childhood in developing countries (Africa, Asia and Central and South America) with poor sanitary conditions; consequently, these countries have low disease rates and HAV outbreaks are rare. Countries with transitional economies, developing countries and countries with variable sanitary conditions are classified as areas with intermediate endemicity and are characterized by higher disease incidence among older age groups. These countries include Southern and Eastern Europe and part of the Middle East. Low endemic countries include Northern and Western Europe, Japan, Australia, New Zealand, USA and Canada. Infection rates in these countries are generally low. As a nation develops, its public sanitation develops leading to increase in the age of acquisition of HAV until adulthood.

The contributing risk factors for HAV transmission include the use of untreated water from contaminated sources (springs, wells) and inadequately treated surface water [4]. Low income countries are also known to have poor water coverage [44]. In this review, we attempted to map the existing data on HAV seroprevalence in the MENA countries. HAV seroprevalence is an important tool to monitor infection rates in a population [3]. We show that MENA countries, similar to other areas in the world, have a clear shift in HAV incidence with a decline among young age groups and an increase among adults and older individuals. Analyzing the available data on water treatment and desalination processes in countries of the MENA, reveal the economic differences between these countries. These differences are associated with infrastructural variations in access to improved water sources. When the data (i.e. availability of better water sources) were coupled with HAV epidemiological trends, it was clear that younger age groups in the majority of the reported studies are becoming more susceptible to HAV infection. In Summary and as previously demonstrated globally [2], exposure to HAV is shifting from young to older age groups with improved standards of living in many countries of the MENA region. This would likely be associated with increased morbidity and increased risks of outbreaks.

Despite the effectiveness of the currently available HAV vaccines and their ability to reduce hepatitis A, recommendations for the vaccine use vary considerably among different countries [59-62]. In a recent position paper, the WHO [63] recommended that vaccination against hepatitis A should be integrated into the national immunization schedule for children ≥ 1 year based on the incidence of acute hepatitis, depending on the change of the endemicity level of the respective country and finally the cost-effectiveness of the vaccination. Consequently, three strategies could be followed: 1) in countries shifting from high to intermediate HAV endemicity where a large part of the adult population is susceptible to HAV infection, vaccination is recommended; 2) in countries with low endemicity, vaccination of high risk groups is to be considered. This targeted vaccination will include men having sex with men, injecting drug users, travelers to high or intermediate endemic countries, in addition to patients with chronic liver disease with increased risk of fulminant hepatitis A; 3) early during an HAV outbreak, the use of a single dose vaccine was found to be successful when different age cohorts were covered.

In a national longitudinal study conducted in the United States of America, the cost-effectiveness ratio of hepatitis A vaccination was reported to be $ 173,000 per life gained and $ 24,000 per quality adjusted life year (QALY) gained. Herd immunity following HAV vaccination added $ 1000 QUALY gained [1]. To our knowledge, Bahrain, Cyprus, Iraq, Israel, Saudi Arabia and Qatar are the only MENA countries that integrated hepatitis A vaccine in their national immunization policies and schedules [64]. Hepatitis A vaccine is offered to children in 2 doses during the first two years of life as well as to high risk groups (the latter is applied specifically in Cyprus, Iraq and Israel).

The currently licensed hepatitis A vaccines are all highly immunogenic, safe, and efficacious [1,65]. Following two doses of vaccine given one month apart, the protective efficacy of vaccines against clinical disease for adults, children and adolescents was reported to be 94–100%. Thirty days following the first vaccine dose, all subjects develop protective levels of antibody. Two doses are currently recommended to ensure long-term protection [63].

During times of conflicts and wars, population displacement emerges as a problem with increased risk of disease mobility. The recent population movement of 2,586,191 Syrian refugees [66] into neighboring countries (Lebanon, Turkey, Jordan, Iraq) and their settlement in densely populated camps with poor sanitation, unclean water supplies, and low-quality housing all contribute to the quick spread of disease in refugee camps. These conditions are expected to influence the epidemiology of several infectious diseases including hepatitis A. Despite efforts of the Water, Sanitation and Hygiene (WASH) initiative to provide refugees with improved water supply and sanitation facilities, the Lebanese Ministry of Public Health reported a marked increase in incidence of hepatitis A in the year 2013 from the usual range of 5-18 cases/100000 to 34 cases/100000 [67]. HAV outbreaks have also been reported in Syrian refugee camps in Iraq and Jordan [86]. The incidence of Hepatitis A among the refugee population may result in an overall increase in hepatitis A seroprevalence within their host country given the high mobility and interaction with the host community. Consequently, many MENA countries urgently need the introduction of HAV vaccines, not only as an emergency response measure but rather as long-term protection of the entire population. Hepatitis A vaccine can be administered with all other vaccines included in the Expanded Programme on Immunization [68].

Our analysis of the available data has an important limitation. The seroprevalence data we included have been extracted from published research and in many instances the samples assessed for anti-HAV might not be representative of the entire population. Moreover, in many countries, the majority of the published data emanated from a specific region. Consequently, we believe that there is a need for more data to support vaccination policies and public health initiatives. Consequently, we recommend the intensification of the surveillance system to continuously estimate the national burden of hepatitis A across the region. The introduction of hepatitis A vaccine should be critically considered to reduce the risk of morbidity and mortality among susceptible children and adolescents in countries of the MENA with developing economies.

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Integrated Approach to Individualized Diabetes Care in Dubai, United Arab Emirates: Cross-Sectional Study

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Keywords: *Diabetes Mellitus, Diabetes Patients, Knowledge, Practices, Diabetes Education, Diabetes Care Team, Public Awareness.*

Abstract

Objectives

This study aimed to investigate diabetic's knowledge and practices in areas that pertain to diabetes, to assess non-diabetics diabetes-related knowledge, and to investigate their perception on the impact of lifestyle measures in diabetes control. The evidence can be used to formulate diabetes healthcare that is more individualized to Emirati culture, and to formulate evidence-based community interventions.

Methods

A cross-sectional study conducted in 4 healthcare facilities and 3 workplaces in Dubai using qualitative and quantitative data collection methods. Using a systematic random sampling method, 145 diabetic patients and 100 non-diabetic participants completed a self-reported questionnaire, and participated in structured interviews and a focus group. Measures investigated in the study were knowledge, diabetes self-management, dieting and physical activity. SPSS version 21 was used to analyze quantitative data, and coding and indexing method was used to analyze qualitative data.

Results

Amongst 145 diabetic participants recruited, 62.8% were female, and 58.6% had under-graduate degree. Majority of participants (95.2%) had type 2 diabetes. Half of the participants (51.0%) were aged between 50-69 years. About half of the participants (44.0%) were not able to identify diabetes symptoms, 34.5% of them reported not visiting health specialists for follow-ups. The mean of days where the self-monitor blood glucose machine was used was 4.1. 56.8% did not follow a diet regime and 57.0% were not engaged in physical activity to control blood glucose level. Females scored higher in incompliance to diabetes management compared to males. Amongst 100 non- diabetic participants recruited, 79.0% were female, and 75.0% had undergraduate degree. Majority of participants (99.0%) had family history of diabetes. Participants' age was between 18 to 60 years. About half of the participants (49.0%) were not able to identify diabetes symptoms, whilst 33.0% of the participants believed that it is not necessary to seek medical help immediately when observing unusual symptoms, whereas 4.0% were

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convinced that it was not necessary to seek medical help at any time point. 29.0% did not perceive diet regime an effective method to control diabetes, and 60.0% were not convinced about the role of physical activity in managing blood glucose levels.

Conclusion

Results of the current study point to gaps in knowledge that may have adverse negative impact on health behaviours, thereby, exacerbating diabetes development and progression . The findings may assist in establishing a unified approach encompassing evidence based, wide-ranging community engagement, and revising community health policies.

Introduction

Diabetes Mellitus (DM) is a metabolic disorder related to several causes. It is characterized by hyperglycemia which indicates high blood glucose level linked to disturbance in carbohydrates (CHO) metabolism as a result of deficiency in insulin secretion, action, or both[1]. DM can lead to serious complications that cause long term damage or failure to body organs. DM complications can be categorized into micro-vascular diseases like retinopathy, neuropathy, nephropathy, and macro-vascular diseases like peripheral vascular disease (PVD) and ischemic heart disease [2,3]. Moreover, DM involves different types. Type 1 diabetes defines the cases related to autoimmune diseases that lead to cells destruction, therefore failure to produce insulin. Type 2 diabetes results from insufficient insulin secretion accompanied with insulin resistance. Finally, there is Gestational diabetes Mellitus (GDM) which affects pregnant women and can disappear post-delivery with effective glucose control[1].

According to International Diabetes Federation (IDF), there are 382 million people in the world with diabetes[4]. The latest IDF figures demonstrated that UAE is ranked 15th worldwide where 18.98% of the population are living with diabetes. Studies conducted showed that majority of the DM cases are attributed to elevated rates of obesity, and physical inactivity in the country[5].

Diabetic patients require continuous medical care, self-management and education. Diet and exercise are crucial components of treatment strategy. It can improve insulin resistance, blood glucose control, and reduce need for oral medications. Diabetic patients who are engaged in physical activities, and adhere to diet guidelines can reduce glycated hemoglobin ($HbA1_c$) significantly. $HbA1_c$ is the average amount of glucose in blood over the past 3 months[6]. Furthermore, a comprehensive insight about diabetes is essential to manage the disease by incorporating the knowledge in the daily self-care. Knowledge of DM involves understanding of diabetes etiology, risk factors, clinical manifestation, symptoms, management strategies, complication, and overall impact on health and wellbeing[7].

DM requires medical care and patient's self-management, which necessitates sufficient and effective education to prevent life threatening complications. According to diabetes health specialists in UAE, major barriers to attaining effective diabetes management are patient's lack of awareness of diabetes and its complications which can impact the level of compliance with treatment plan. There is misunderstanding and underestimating the role of diabetes educators from the patients. It is manifested in their preference to receive solely the medical care from endocrinology specialists. The most crucial barrier is the impact of Emirate culture on health behaviors and beliefs[8] **.**

Diabetes Mellitus cases in the UAE are attributed to elevated rates of obesity, and physical inactivity due to rapid socioeconomic changes [4]. A longitudinal cohort study was carried out in the United States on 50277 women with Body Mass Index (BMI) of less than 30kg/m^2, and free of diabetes . After a 6 years of follow-up the results showed that approximately 8% of the women became obese, and there were 1515 new reported cases of diabetes. Each 2 hours spent in sedentary behaviors was associated with an increase of 23% in obesity, and 14% increased risk of diabetes [9]. Thus, simple preventative measures can reduce the burden of diabetes. Those measures include lifestyle modification such as maintaining healthy body weight, being physically active, and eating a healthy diet. It can prevent or delay the onset of the disease. To attain this, sufficient diabetes-related knowledge is essential. It forms a foundation for good health-related practices on a daily basis.

The alarming rates of diabetes in UAE reflect lack of alignment between diabetes clinical care and diabetic patient's knowledge and practices, which impacts patient's treatment approaches. In addition, poor knowledge amongst member of community contributes to the development of diabetes more rapidly.

Objectives

The objectives of this study were to examine patient's knowledge and practices in areas that may impact the management of diabetes; and to assess non-diabetics knowledge related to diabetes that may have an impact on diabetes development.

Methods

Study Design and settings

A descriptive cross-sectional study was conducted in 4 healthcare facilities and 3 workplaces in Dubai. The study utilized quantitative and qualitative approaches for data collection. Ethical approval for the study was obtained from Zayed University Research Ethics Committee. Selected workplaces and healthcare facilities were approached and informed about the study. Consequently, 4 healthcare facilities and 3 workplaces agreed to take part in the study. Written consent was obtained. In addition, participants signed a written consent form stating that participation in this study was voluntary, identities remained anonymous, and results were going to be used for research purposes. The researcher provided participants with instructions prior to completing the self-administered questionnaire. The questionnaires were completed in the workplace and clinic's waiting area in the absence of the researcher. Structured interviews and a focus group were conducted in a setting in the community which was selected in agreement with the participants.

Population and sampling

The study participants were non-diabetic employees (n=100) working for private, semi-government, and government organizations. The majority of participants were female (79%), and (21%) were male; aged 18 to 60 years. All participants were UAE nationals. The other group of participants were diabetic patients attending healthcare facilities. Out of 145 diabetic patients, 62.8% were females and 37.2% were males. Pregnant women with diabetes and diabetics under 18 years old were excluded from this study while people with type 1and type 2 diabetes over 18 years old were included in the study. All diabetes patients were Emiratis.

Participants were recruited using systematic random sampling method. A list of departments was obtained from the participating workplaces. Every second department was approached via email to obtain approval, and a list of employees working in the designated departments was obtained. Every fifth employee was asked to participate in the study voluntarily. They were also asked if they were willing to take part in a structured interview and/or focus group. Thirty participants took part in structured interview , and out of the 30 participants 6 took part in the focus group. Similar method was employed to recruit diabetic participants. The list of appointments in the participating clinics was obtained to find out the number of the appointments per day. Every 5th patient entered the clinic was asked to take part in the study voluntarily. Participants filled out self-administered questionnaire. They were also asked if they are willing to take part in a structure interview. It was held in an independent setting in the community suggested by the participants. Out of the145 diabetic patient's that were recruited to fill out the questionnaire, 30 patients took part in the structured interviews.

Instrument

The questionnaire themes were extracted from Michigan Diabetes Research and Training Center Diabetes Care Profile Instrument. It assesses patient's attitude, beliefs, knowledge, self-reported diabetes self care[10] . Some questions were omitted or modified due to lack of in-depth approach and lack of relevance to Emirati Culture. Topics covered were demographics, dieting, physical activity, medications, general understanding of diabetes risk factors and symptoms, and overall rating of self-health status. Regarding the non-diabetic participants, themes covered were demographics; diabetes symptom, risk factors and complications knowledge; as well as their perception on dieting and physical activity as modes of diabetes management. The questionnaire was distributed both in English and Arabic for language convenience, and to ensure participant's responses were accurate. Both versions were piloted on 10 members from the community. The results were not included in the study.

Measures

Knowledge

Non-diabetic and diabetic participants were asked to identify diabetes symptoms and risk factors using a dichotomous question form. The answers were: (yes/no). If they answered yes, then they were asked to select diabetes symptoms and risk factors from a provided list. Non-diabetic participants were also asked about the timeline of when to seek medical care for the purpose of diagnosis of diabetes. The answers were: (it is not necessary to seek medical care, wait for a period of time, seek medical care immediately). Diabetic Participants were asked if they approached health specialist for diagnosis as soon as they noticed odd symptoms. The responses were: (yes, no). If they answered yes, they were asked to specify how long they waited before seeing health specialist.

Dieting and Physical Activity

Non-diabetic participants were asked about their perception of controlling diabetes using a healthy diet and physical activity in additional to conventional diabetes interventions using a dichotomous question form. The answers were: (yes/no). Diabetic participants were asked 2 question about their diet. They were asked if they are on diet to control their blood glucose level. The responses were: (yes/no). If they answered yes, then they were asked to select type of diet followed. Responses were categorized into: (high protein-low carbohydrates diet, carbohydrate counting diet, complete elimination of sugar/carbohydrates). Regarding physical activity, diabetic participants were asked if they are engaged in any form of physical activity to control their blood glucose level. The responses were: (yes/no).

Diabetes Self-Management

Diabetic participants were asked if they visit diabetes health specialist periodically, after diagnosis for diabetes health care. The responses were: (yes/no). They were also asked if they own and SMBG machine, to which the responses were: (yes/no); and how often they use SMBG machine per week. The responses were: (0 day, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, and 7 days). The answers were categorized into (less than 4 days a week, more than or equal to 4 days a week).

Data Analysis

Data was analyzed using SPSS program version 21. Chi-square analysis test was used to confirm significance, and confidence interval was set at 95% with p-value of less than 0.05. Coding and indexing method was used to analyze qualitative data.

Results

Demographic Characteristics

Table 1 shows that 62.8% of diabetic participants were females, while 79.0% of non-diabetic participants were females. The study participants aged between 18 to 60 years old. Majority of diabetic and non-diabetic participants had undergraduate degree, 58.6% and 75.0% respectively, whilst 21% had a high school certificate. Only 2% had no formal education, and another 2% had a post-graduate degree. The occupational status of non-diabetic participants was evenly distributed where 47.6% were unemployed and 42.3% were employed; while the minority were retired (10.1%), (Table 1).

Table 1 – Demographic Characteristics of the Research Participants

Characteristic	**Diabetic Participants**	**Non-Diabetic Participants**
Gender	Female (62.8%) Male (37.2%)	Female (79.0%) Male (21.0%)
Age		
Less than 45 years old	49%	58%
Above 45 years old	51%	42%
Level of Education		
Illiterate	20.7%	0
High School Certificate	18.7%	23.0%
Undergraduate Degree	58.6%	75.0%
Post- graduate Degree	2.0%	2.0%
Occupation		
Unemployed	47.6%	0
Employed	42.3%	100%
Retired	10.1%	0

Diabetes Mellitus Knowledge

Table 2 shows that almost half of the diabetic (44.0%) and non-diabetic participants (49.0%) are not aware of diabetes symptoms. Amongst the diabetic participants, 40.0% reported not using the self-monitor blood glucose machine, and 34.5% did not attend their appointments regularly, (Table 2).

Table 2 – Percentage (%) of Participants Response towards DM Knowledge Domains

Knowledge Domains	**Diabetic Participants** **Total (%), n=145**	**Non-Diabetic Participants** **Total(%), n=100**
Diabetes Risk Factors		
Able to identify	68.0%	74.0%
Don't Know	32.0%	26.0%
Diabetes Symptoms		
Able to identify	56.0%	51.0%
Don't know	44.0%	49.0%
Diabetes Complications		
Able to identify	63.0%	65.0%
Don't Know	37.0%	35.0%
Using Self-Monitor Blood Glucose Machine (SMBG)		
Use SMBG	60.0%	-
Don't use SMBG	40.0%	-
Follow-up visits		
Regularly follow-up visits	65.5%	-
Don't follow-up regularly	34.5%	-

Components of Diabetes Management

Table 3 shows the distribution of diabetes management components utilized by the diabetic participants. The vast majority reported using conventional drugs to control their blood sugar level. Almost half of the diabetic participants reported not following a physical activity (42.0%) and diet (43.0%) regimen. A significant difference was observed between the genders, (Table 3).

Table 3 – Distribution of Diabetes Management Components Amongst Diabetic Patients by Gender

Components	**Number (%)**	**Males n=54, Number(%)**	**Females n=91 Number (%)**
Conventional Medication			
Yes	133 (92.0%)	44 (81.4%)	89 (97.8%)
No	12 (8.0%)	10 (18.6%)	2 (2.2%)
Physical Activity *			
Yes	84 (58.0%)	47 (87.0%)	37 (40.6%)
No	61 (42.0%)	7 (13.0%)	54 (59.4%)
Dieting *			
Yes	83 (57.0%)	41 (76.0%)	42 (46.2%)
No	62 (43.0%)	13 (24.0%)	49 (53.8%)

*$p<0.05$

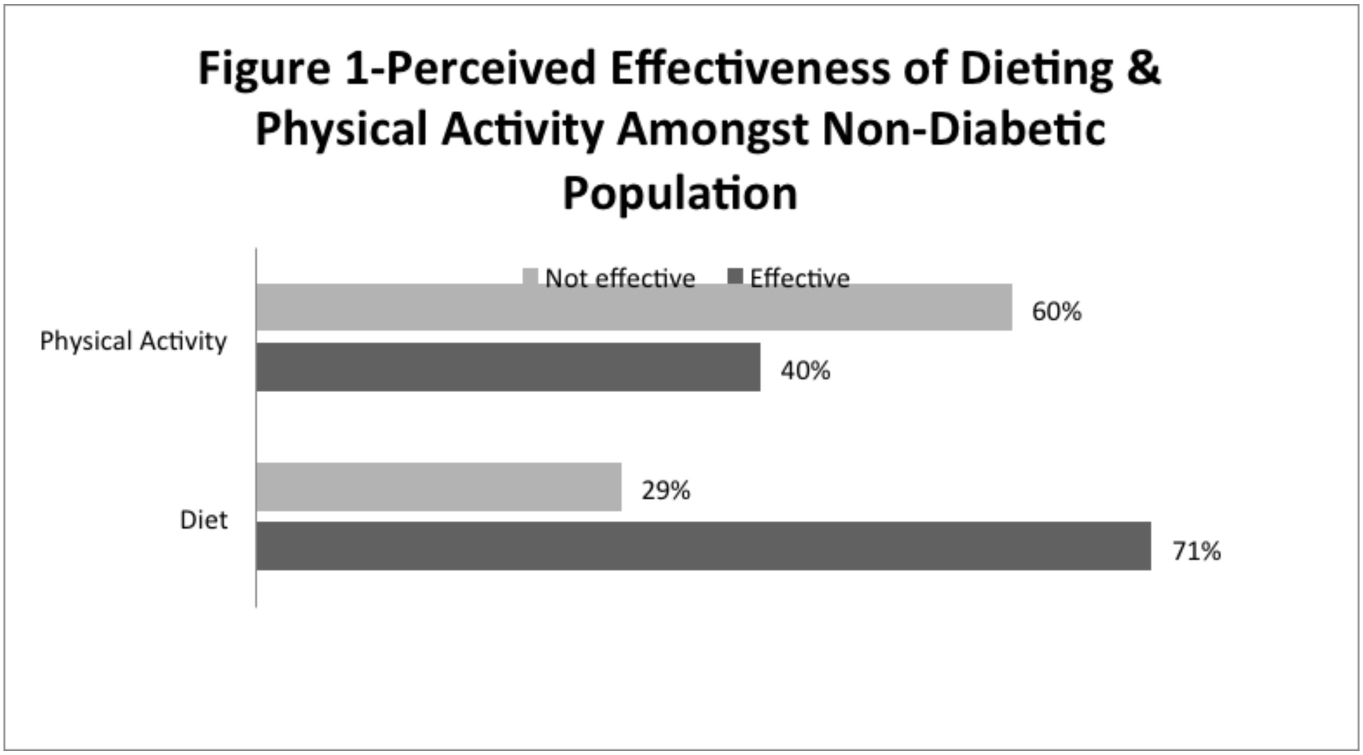

Figure 1 outlines non-diabetic participants' perceived effectiveness of dieting and physical activity as modes of diabetes management. Twenty nine percent and sixty percent of participants did not believe in the effectiveness of diet and physical activity as methods of controlling diabetes respectively. Interestingly, majority of participants who did not perceive dieting and physical activity as effective means to control diabetes had undergraduate degrees. There was no statistically- significant difference between groups based on their educational level.

Discussion

Adequate level of knowledge about the basics of diabetes is critical for preventing the disease and limiting its progression. Almost half of the non-diabetic participants could not identify diabetes symptoms, and 26% were unaware of diabetes risk factors. The results in the current study are consistent with other studies conducted in the UAE. A study conducted amongst non-diabetics attending a hospital in the emirate of Ras Al Khaima (RAK) showed that 40% of the participants did not know the diabetes risk factors, and 21% were unaware of diabetes symptoms [11]. Another study conducted in the Emirate of Ajman revealed that just over half of the participants couldn't link diabetes to obesity or lack of physical activity [12]. A similar study was conducted in Nigeria showed that more than half of the participants were not aware of diabetes risk factors and symptoms (61% and 52% respectively) [13]. The lack of knowledge of participants regarding risk factors associated with diabetes may increase the likelihood of them developing the disease in the future. Equally worrying is the inability to identify diabetes symptoms which may also hasten the progression of the disease should they develop it at any stage in their life. As a result, they can engage in health behaviors that exacerbate diabetes development and progression.

Equally alarming was the low level of understanding of DM risk factors and symptoms amongst the diabetic participants. Similar studies conducted attained related findings such as a study conducted in Al Ain Diabetes Centers found that 31% of diabetes patients had poor knowledge in diabetes [14].This indicates that people with diabetes were unaware that they were at high risk of developing it, or that they had already developed the disease. Thus, they were more likely to engage in certain health behaviors that contribute to diabetes more rapidly or exacerbate their condition.

Additionally, results showed that significant percentage of diabetic patients reported not visiting health specialists regularly. Reasons provided by participants were fear from health specialists, lack of trust between health specialists and patients, ineffective communication method used by health specialists, or fear to confront reality of their health condition. Others said that high prevalence of Diabetes in UAE made them underestimate the disease severity in the long term. As they stated *"it became a society norm".* They admitted that they intentionally ignore attending some of their appointments with diabetes care team members because they believe that only the endocrinology specialist is important. Main reason given was that he/she prescribes medications. Participants agreed that they tend to miss mainly their appointment with dietitians because the diet plan provided was not feasible, difficult to comprehend, or not customized based on patient background, knowledge level, and psychological status. They said *"instead of bombarding patients with measurements and numbers, it is more effective to empower patients with practical skills related to daily lifestyle".*

Furthermore, healthy diet and physical activity are the cornerstone of diabetes treatment. Lack of it can initiate the disease, exacerbate the condition, and fail DM management. Despite that, results showed that more than half of diabetic participants were not convinced about the role of diet and physical activity. Low level of compliance to diet and exercise regimen was prominent amongst female patients. Explanation provided by the study participants was that females face more social constrains and lack of family support. Females also tend to have many excuses that hinder their condition management such as lack of time, family responsibilities, and social gatherings. Many participants believed that diabetes is not related to food intake, and a good number of participants saw that as long as they take their medication; food intake will have no effect. The latter was proven in the results as the vast majority of participants reported taking medications as prescribed. A study conducted on 409 diabetic patients in Al Ain City Outpatient Clinic to assess their knowledge and practices related to nutrition found that 76% were unable to differentiate between foods high or low in CHO. 24% did not know how to read food label, and 46% reported that they have not seen dietitian since they were diagnosed [15] .Furthermore, results showed that high percentage of participants were not engaged in physical activity. The alerting rates indicate that diabetics continue in adopting unhealthy behaviors similar to pre-diagnosis which makes it difficult to manage the disease.

Additionally, some of diabetic participants who reported monitoring their blood glucose stated that they do not know how to interpret the readings. This makes them unaware of their health status. As a result, they will not be able to take essential steps to manage their condition.

More than half of the study non-diabetic participants did not perceive physical activity as an effective mode to diabetes management. Barriers to physical activity reported by participants in the focus group of the current study reflect differences amongst the genders, with female participants reporting that lack of physical activity was due to cultural barriers and family pressures; whilst male participants main reason was the fast pace of life and the professional pressures. Also, 29% of participants did not believe diet can aid in diabetes management. The study findings are almost similar to previous reported studies. In the emirate of Ras Al Khaima, 31.3% were aware of diabetes management through lifestyle modification, and 50% in the emirate of Ajman. The latter finding can be attributed to the fact that Ajman study participants were university students. However, in Nigeria only 15.4% were aware of the role of weight loss in diabetes management [11-13]. The lack of knowledge in the importance of the impact of physical activity and diet on diabetes can increase the prevalence of diabetes in the coming years, hence, increase the burden on the healthcare sector in the UAE.

Most importantly, inadequate knowledge amongst non-diabetics may have an impact on family members with diabetes, because of their inability to provide support. In the UAE, and as with many other Middle Eastern societies, family plays a vital part in the vast network of support that is accessed by the diabetic patients. Two studies were conducted in the United States to examine the relationship between family support with regard to diet and physical activity, and self-care amongst type II diabetics, with participants age average of 55 years and above. High levels of knowledge amongst non-diabetic members in the family led to high rates of family support provided to the diabetic participants. It was linked to high levels of adherence to diet and physical activity, and less barriers perceived by the diabetics [16-17].

To summarize; the current study demonstrated low levels of knowledge pertaining to diabetes amongst non-diabetics and diabetic participants. This has potential to increase prevalence of diabetes in the UAE. Community outreach projects, and health policies must therefore go beyond educating the diabetic population and extend its mission into the wider community.

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Walk Strong, Live Long! Increasing ambulatory physical activity in male Emirati adolescents through a school-based walking campaign

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Keywords: *Adolescent, Arabs, physical activity, school health services, United Arab Emirates, walking.*

Abstract

Introduction

Despite the importance of increasing physical activity levels in adolescent populations, limited research on the topic has been undertaken in Arabic populations. Recent research estimates that the prevalence of adolescent obesity is over 20% in the United Arab Emirates (UAE) and that physical inactivity is one of the key vehicles driving weight gain in this population. Numerous studies have shown that adolescent weight gain paves the foundations for adult obesity and associated conditions (e.g. type II diabetes). As health behaviours are established early in life, it is important to focus on fostering and adopting physical activity habits during adolescence.

Objectives

Evaluate the efficacy of a school-based walking campaign to increase ambulatory physical activity and enhance awareness of the health benefits of walking in male Emirati adolescents.

Methods

Following ethical approval, 746 male students (age 16.2 ± 1.6 years) attending a weekday residential school in the UAE participated in a four-week walking campaign. The walking campaign utilised a multi-pronged educational program (Arabic-English) to raise awareness about the health benefits of walking that included positioning posters and leaflets in prominent positions around

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the school building, canteen and student accommodation; articles in the school newsletter; and a 45-minute lecture on the health benefits of walking. Students were provided with personal pedometers (Yamax Digiwalker 351, Tokyo, Japan) designed to act as a motivational feedback tool and environmental cue, and walking log books to record their daily step counts. School staff organised lunch- and evening-time walking clubs to promote ambulatory physical activity during school break periods. To assess the efficacy of the walking campaign on increasing ambulatory physical activity, 22 students wore an additional sealed pedometer for three four-day (Sunday to Wednesday) monitoring periods: before the campaign (Pre-Campaign), mid-point of the campaign (Mid-Campaign), and two weeks after the campaign (Post-Campaign). A random sample of students (n=66) completed a post-campaign review questionnaire assessing students' awareness of the health benefits of walking.

Results

Compared to baseline ambulatory physical activity levels (11215 ± 2415 steps/day), mean (± SD) daily step count significantly increased Post-Campaign (15039 ± 7014 steps/day; P£.05), but not Mid-Campaign (12045 ± 3669 steps/day; P^{3}.05). Nearly three-quarters (73%) of students reported that the walking campaign increased their awareness of the health benefits of walking and 70% reported that the walking campaign increased their motivation to become more physically active. Sixty-four percent of students reported that the walking campaign increased their daily step count and level of physical activity.

Conclusions

Study findings suggest that a multi-pronged educational campaign coupled with the provision of pedometers offers a practical approach to increasing daily ambulatory physical activity in school-based male adolescents. To our knowledge, the 'Walk Strong, Live Long' Campaign is the first school-based multi-pronged walking intervention in the UAE. Future studies may want to explore the efficacy of similar school-based walking interventions on improving anthropometric indices, cardiovascular fitness, and chronic disease biomarkers in Arabic adolescent populations.

Introduction

Formed in 1971, the United Arab Emirates (UAE) is a country composed of seven emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah and Umm Al-Quwain) located in the southeast of the Arabian Peninsula.[1,2] The UAE has experienced remarkable economic and industrial growth during the past 43 years.[3] Consequently, the Emirati population have experienced a significant increase in affluence and a concomitant shift from a traditional semi-nomadic lifestyle to a modern, urbanised and technology-driven lifestyle characterised by reduced occupational, domestic and leisure-time physical activity coupled with the overconsumption of energy-dense convenience foods with poor nutritional content.[4] Accordingly, there has been a dramatic increase in the prevalence of obesity, diabetes and cardiovascular disease in adults of all age groups. Indeed, the UAE has one of the highest age-standardized death rates for cardiovascular disease in the world i.e. 308.9 per 100,000 for males and 203.9 per 100,000 for females.[4] Recent proportionate mortality statistics for the emirate of Abu Dhabi in 2013 revealed that more than a third (37%) of all deaths were due to cardiovascular disease.[5] Unless there are major changes in behavioural and metabolic risk factors at a population level (particularly amongst adolescents), then the cardiovascular disease mortality rates are set to increase further as the youthful population ages. Alarming evidence suggests that 30-40% of adolescents within the UAE are overweight or obese.[6,7] Underlying these body size concerns are findings from the World Health Organisation reporting that only 20% of Emirati school children meet daily physical activity guidelines and only 50% are taught the benefits of healthy eating.[8] Consequently, school-based health interventions targeting the adoption and maintenance of healthy lifestyle habits that have the potential to improve the overall health and wellbeing of adolescents are worthy of consideration.

Objectives

Evaluate the feasibility and efficacy of a multifaceted, culturally appropriate school-based walking campaign to increase ambulatory physical activity and enhance awareness of the health benefits of walking in male Emirati adolescents.

Methods

Study Design

Whole-school multi-component health intervention from September 2008 (start of school year) to June 2012 (end of school year). This paper reports on a four-week (February to March 2009) multi-pronged walking intervention nested within the main study that utilised a non-experimental pre-test post-test design.

Study Setting and Sample

Participants described in this article are from a cohort of male Emirati adolescents (n=746; age 16.2 ± 1.6 years) that attended a weekday residential school in the city of Al Ain, Abu Dhabi, UAE. The school was funded by the Federal Government to improve the health, physical fitness and wellbeing of adolescent UAE Nationals attending the school. Briefly, all students participated in, or were exposed to, a range of health interventions and initiatives. These included: a classroom-based health education syllabus (five lessons per 12 week term); health campaigns (two per term; see [9] for hydration example); individual and group dietetic clinics dietetic clinics for 'priority students' (underweight, overweight and obese); canteen traffic light food labelling; physical training programmes (see [10] for more information); physical rehabilitation for injured students. This multi-component health programme was delivered throughout the nine month academic year, and withdrawn over the three month summer break. All participants provided written informed consent, and ethical clearance was granted by the Al Ain Medical District's Human Research Ethics Committee in the United Arab Emirates.

Walking Intervention

Educational Component and Walking Clubs.

The walking campaign utilised a multi-pronged educational program (Arabic-English) to raise awareness about the health benefits of walking that included positioning posters and leaflets in prominent positions around the school building, canteen and student accommodation; articles in the school newsletter; and a 45-minute lecture on the health benefits of walking. School staff organised lunch- and evening-time walking clubs (25-40 min at a typical walking rate of 4 km/h) to promote ambulatory physical activity during school break periods.

Pedometer and Log Books.

A pedometer is a small lightweight electronic motion sensor which responds to vertical accelerations of the human body during ambulatory activities such as walking or running. Pedometers provide a valid and reliable, objective measure of ambulatory activity in children (>5 years) and adolescents.[11] As such, all students were provided with personal pedometers (Yamax Digiwalker 351, Tokyo, Japan), as well as a walking log book to record their daily school day step counts from waking to sleep for five days (Sunday to Thursday) during each week of the programme. Thursday was a half-day at the residential school with students transported back to their parents' homes across the seven emirates at midday. Therefore, step count data was only analysed from Sunday to Wednesday. Photographic instructions showing the correct placement of the pedometer were provided to each participant, each of whom was carefully instructed to wear the pedometer on the waistband in the midline of the right thigh for the whole of the working day. Pedometers were utilised for three main purposes: (i) provide quantitative real-time feedback to participants on ambulatory physical activity; (ii) act as a motivational tool and environmental prompt to be physically active; and (iii) to objectively evaluate changes in physical activity in a sub-group of students (n=22).

The present study utilised the Yamax Digiwalker SW-700 (Yamax Corporation, Tokyo, Japan) which, when compared to 15 other models of pedometer, has been found to be one of the most accurate (correctly counting the number of steps and estimating distance walked), reliable (high inter-instrument agreement), and sensitive electronic pedometers currently commercially available, both in controlled and free-living conditions in populations ranging from 7 to 74 years.[12-20] In addition, Swartz and colleagues[21] found that step count accuracy/distance estimation did not differ across a wide range of body mass index values and in a controlled shake test, the Yamax Digiwalker exhibited less than 3% error, confirming the quality criterion for technical accuracy applied by its manufacturer.[22] All pedometers were checked for accuracy using a standard 100-step test prior to dissemination to study participants.

Outcome Measures.

To assess the efficacy of the walking campaign on increasing ambulatory physical activity, 22 randomly selected students wore an additional sealed pedometer for three four-day (Sunday to Wednesday) monitoring periods: before the campaign (Pre-Campaign), mid-point of the campaign (Mid-Campaign), and two weeks after the campaign (Post-Campaign). In addition, a random sample of students (n=66) completed a post-campaign review questionnaire assessing students' awareness of the health benefits of walking.

Data Treatment and Analysis.

Tudor-Locke et al.[23] proposed that a minimum of three days (including at least one weekend day) of pedometer data is required to estimate free-living physical activity in a seven-day week. However, the present study was investigating the efficacy of a school-based walking campaign on increasing ambulatory physical activity in adolescents during the school week. Therefore, programme completers were defined as students that recorded at least three days of pedometer-derived step counts per school week (five days). Missing step data was recovered by adopting the individual information-centred method for handling missing pedometer data proposed by Kang and colleagues[24] which utilises an individual's average based on the mean of the remaining days of the observation period (school week in the present study). The individual information-centred approach was favoured over the group information-centred approach which is the most common recovery method and utilises a mean from the sample to replace an individual's missing value.[25] The group information-centred approach is not appropriate when repeated measures are used (i.e. multiple days of data collection) on the same experimental unit (e.g. an individual) as it may bias the results (Laird 1998);[26] rather, replacements based on intra-individual information generate a more accurate recovery of the missing data because intra-individual variability is lower than inter-individual variability.[23,24]

Using subjects as their own controls (non-experimental pre-test post-test design); physical activity (pedometer-determined steps per day) was compared before and at the end of the three-week intervention using a repeated measures ANOVA. All analyses were conducted using IBM SPSS Statistics software (version 19; SPSS Inc., Chicago, IL, USA) and the alpha level was set at .05.

Results

Source population and study sample characteristics are presented in Table 1.

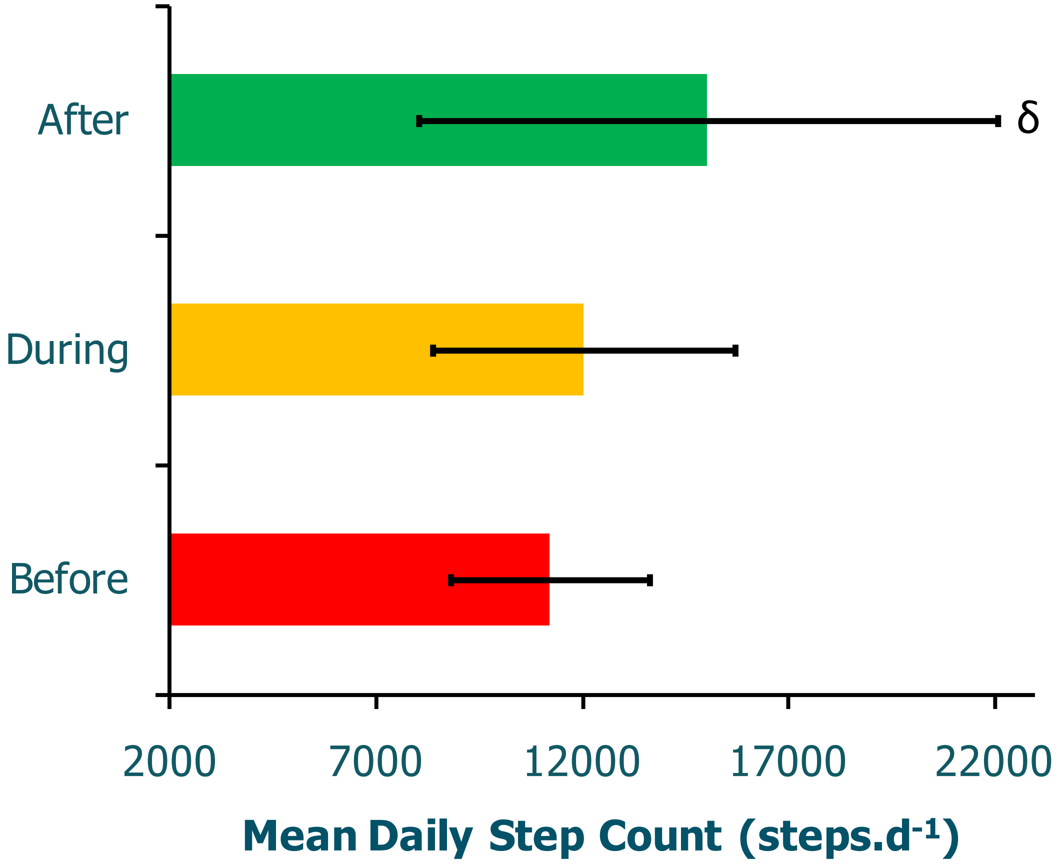
Table 1. Body size and physical fitness data for all school students and the walking campaign research group February 2009

	Whole School February 2009			Walking Campaign Research Group February 2009		
	n*	**Mean**	**SD**	**n**	**Mean**	**SD**
Height (cm)	720	**169.6**	6.7	22	**169.8**	5.2
Body Mass (kg)	720	**68.8**	17.0	22	**67.9**	14.6
BMI (kg·m^{2})	720	**23.5**	5.4	22	**23.5**	4.7
WC (cm)	720	**77.8**	13.0	22	**76.5**	12.4
WHTR	720	**0.46**	0.07	22	**0.45**	0.07
One-mile run time (min:s)	730	**08:37**	02:07	22	**08:12**	02:10
Push-ups (reps·min^{-1})	728	**26**	14	22	**29**	16
Sit-ups (reps·min^{-1})	730	**39**	9	22	**38**	10

Note. BMI = Body mass index, SD = Standard deviation, WC = Waist circumference, WHTR = Waist-to-height ratio. WHTR ³ 0.5 indicates increased risk for cardiovascular and metabolic complications. *Data represents students not absent from school or injured during anthropometric and/or physical fitness assessment periods.

Compared to baseline ambulatory physical activity levels (11215 ± 2415 steps/day), mean (± SD) daily step count significantly increased Post-Campaign (15039 ± 7014 steps/day; P£.05), but not Mid-Campaign (12045 ± 3669 steps/day; P>.05; see Figure 1). Nearly three-quarters (73%) of students reported that the walking campaign increased their awareness of the health benefits of walking and 70% reported that the walking campaign increased their motivation to become more physically active. Sixty-four percent of students reported that the walking campaign increased their daily step count and level of physical activity.

Figure 1. Daily step counts (mean ± 1 SD) before, during and after the walking campaign (δsignificantly different from 'Before'; P<.05).



Discussion

The main finding of the study was that a multi-pronged educational campaign coupled with the provision of pedometers offers a practical approach to increasing daily ambulatory physical activity in school-based male adolescents. Previous research concluded that male students failing to achieve 15000 steps·d^{-1} were more likely to be overweight/obese compared to male students exceeding 15000 steps·d^{-1} (Tudor-Locke et al., 2004).[27] The results of the current study demonstrates that it is possible for male UAE adolescents attending a week-day residential school to accrue an average of 15000 steps per day during waking hours. Furthermore, this relatively simple and resource-minimal walking intervention was effective in raising students' walking physical activity from sub-optimal levels (i.e. < 15000 steps.d^{-1}) to levels better associated with health benefits.

To our knowledge, the 'Walk Strong, Live Long' Campaign is the first school-based multi-pronged walking intervention in the UAE. A pedometer offers a practical, while cost-effective approach to increasing daily physical activity in school-aged adolescents. Schools are important arenas for health promotion and teachers should be encouraged to create active environments in an attempt to enhance student health and wellbeing. Future studies may want to explore the efficacy of similar school-based walking interventions on improving anthropometric indices, cardiovascular fitness, and chronic disease biomarkers in Arabic adolescent populations.

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Effectiveness of Structured Teaching Programme on life style modification in cardiac patients for Maintaining Healthy Heart

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Keywords: *lifestyle modifications (LSM), effectiveness of Structured Teaching Programme (STP), risk factors, Healthy heart.*

Abstract

Background

Cardiovascular disease is becoming a chronic, major health problem and an epidemic in India; also having the highest burden of acute coronary syndromes in the world causing increasing number of deaths among the younger age group 42.50 ± 9.41(males), 38.89 ± 11.22 (females), with overall incidence of 12.63 affecting the productivity of economy .

Life style modification through educational intervention is an essential weapon and forms the basis of primordial prevention of modifiable risk factors of CAD progression. A study was conducted with an over all Aim to assess the Effectiveness of STP on knowledge Regarding LSM for Maintaining Healthy Heart Among Cardiac Patients in selected hospitals of Bengaluru before and after administration of Structured teaching programme.

Method

Quasi experimental (pre – experimental) consisting of one group pre test, post test design, using purposive sampling technique was conducted to evaluate the knowledge of N=60 cardiac patients using an Interview schedule. Pretest was conducted and then immediately STP was given and then again conducting Post test for the same group after one week using same Interview Schedule to find out the effectiveness of STP. The design did not include any control group hence evaluative research approach was used.

Results

The statistical paired "t" value of 16.71, using SPSS v.18 was s significant at 5% level ($p < 0.05$), indicating the positive impact of intervention programme in post knowledge score.

Overall knowledge enhancement was 26.1% , post test knowledge score being 76.5% was higher than pretest knowledge score 50.5%. Hence the study concludes that individualized teaching program is effective and urges, every one should lead a conscious life style that prevents diseases.

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Introduction

"To ensure good health eat lightly, breathe deeply, live moderately, cultivate cheerfully and maintain interest in life"- Unknown

Every one should lead a conscious life style that prevents diseases. Cardiovascular disease is becoming a chronic, major health problem and an epidemic in India; India has the highest burden of acute coronary syndromes in the world (Viswanathan,2001).

CAD being epidemic and chronic in india is increasing number of deaths among the younger age group 42.50 ± 9.41(males), 38.89 ± 11.22 (females), with overall incidence of 12.63 affecting the productivity of economy. The estimated prevalence of CAD in India is currently about 3% in rural areas and 8% to 10% in urban zones. Several conventional and non conventional risk factors appear likely to have contributed to the acceleration of Coronary artery disease epidemic in India(Fernandez 2008).

The gravity of this situation is emphasized by a recent projection from the WHO and the Indian council of medical research (ICMR) which predicts that India will be the MI capital of the world 2020 (Saeed Omar 2009). Majority of participants (58.6%) lacked the predefined good level of knowledge pertaining to modifiable risk factors. Knowledge on life style modification is a pre-requisite, pre-condition to implement progressing of CAD. Educational interventions are needed to make Indian public aware of modifiable risk factors of CAD (Saeed Omar 2009).

Life style modification is an essential weapon through which certain personal habits and risk factors comprising the health of heart are to be made major targets to lead a healthy life style. Life style modification has been reported beneficial to CAD patients, delay the progression of disease and helps to maintain healthy heart (Abinav, 2006)

Investigation in the view of above aspects, lack of studies conducted in India related to the knowledge of life style modification for maintaining healthy heart in cardiac patients' and investigators experience and observation of lack of adequate knowledge among patients in clinical cardiac care wards at Sri Jayadeva Institute of Cardiovascular Sciences & Research is a Government owned Autonomous Institute and is offering super specialty facilities, Bengaluru is an impetus for the study. Recently life style modification is being reviewed in India to form the basis of primordial prevention in CAD disease progression, hence Investigator felt the need for the study.

The over all Aim / Objective of the study aim of the study was to assess the Effectiveness of STP on knowledge Regarding LSM for Maintaining Healthy Heart Among Cardiac Patients in selected hospitals of Bengaluru", before and after administration of planned teaching programme.

The conceptual model for the study was based on the General system theory(GST) by Karl Ludwig Von Bertanlanffy (1968). In this theory the main focus is on the discrete parts and their interrelationship, which consist of input, throughput and output

Methodology

The research design used was quasi experimental (pre – experimental) consisting of one group pre test, post test design to evaluate the knowledge of 60 cardiac patients using an Interview schedule in Male and Female General wards of Shri Jayadeva Institute of cardiovascular sciences and Research, Bengaluru using purposive sampling technique. Using Ethical approval was obtained and granted from the Hospital Research committee before conducting the study. The participants were explained about the study and its significance, before signing the consent form.

Pretest was conducted and then immediately STP was given and then again conducting Post test for the same group after one week using same Interview Schedule to find out the effectiveness of STP. The design did not include any control group hence evaluative research approach was used.

The constructed tool of interview schedule had reliability co-efficient of 0.936 and validity co-efficient worked to be 0 .967 using split half technique with the raw score method. The STP developed was based on the topic of the study, review of the related research publications, non-research literature and objectives stated in the blue print. The draft of STP along with the criteria checklist was given to 12 experts in the field comprising of 8 nurse educators and 4 doctors. The experts were requested to validate STP based on the criteria checklist comprising the Objectives, Content (selection, Organization, Presentation) and

Language. Changes were made as suggested. The STP was delivered in the local language. STP was conducted for a period of one hour on the same day of pre test for 5 cardiac patients in the morning and 5 clients in the afternoon session. Overhead transparencies, flipcharts, chart, models, pamphlets were used as visual aids to facilitate easy understanding.

Results

The mean post test knowledge score of the cardiac patients regarding LSM for maintaining healthy heart was significantly higher (58.3%) had adequate knowledge, 41.7% had moderate knowledge, and 0.00% of the respondents had inadequate knowledge in comparison the pre test knowledge score.(0.00.%) of the respondents had adequate knowledge, whereas 46.7% had inadequate knowledge, and only 53.3% had moderate knowledge about life style modification . Statistical analysis was performed using SPSS v.18. The statistical paired "t" implies that the difference in the pre Test and Post Test knowledge score found to statistically significant at 5% level ($p < 0.05$), with paired 't' value of 16.71, there exists a statistical significance in the post knowledge score indicating the positive impact of intervention programme.

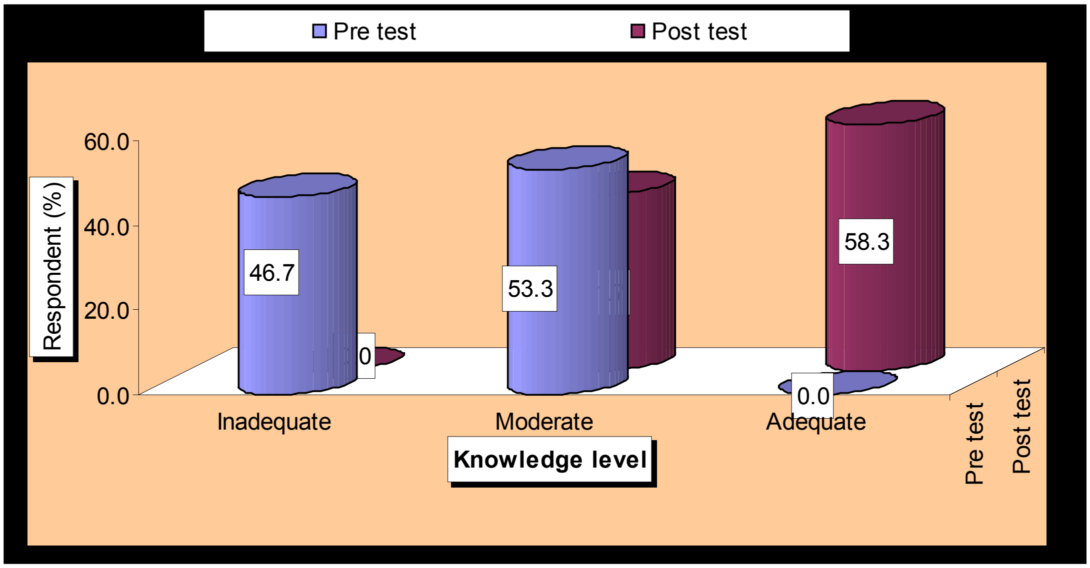

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Figure.1: Classification of respondents on knowledge level on life style modification.

In relation to the demographic variables , the maximum numbers of subjects (36.7%) were from the age group of 46-55 years and (33%) were from the age group of 31-45 years) . 78.3% of the respondents was male, 21.7% were female. In relation to personal habits 58.3% of the respondents were smokers, 35% were alcoholics, 25% had pan chewing habit, and 13.3% had tobacco chewing habit. While only 11.7% reported that they do not have any personal habits, although some of the respondents had multiple habits at the same time.

Further in Presence of Risk factor 81.7% of the respondents mentioned stress as a risk factor, 71.7% smoking, 56.7% ,obesity 21.7% ,diabetes 20% Hypertension . whereas in relation to Awareness on Coronary Artery Disease 55% were aware of CAD in comparison to 45.%. similarly, in relation to Source of Information on CAD 56.7 % of the respondents reported health personnel as their source of information, while 28.3% did not have any source of information on CAD, others 16.7% as TV, Radio, print media.

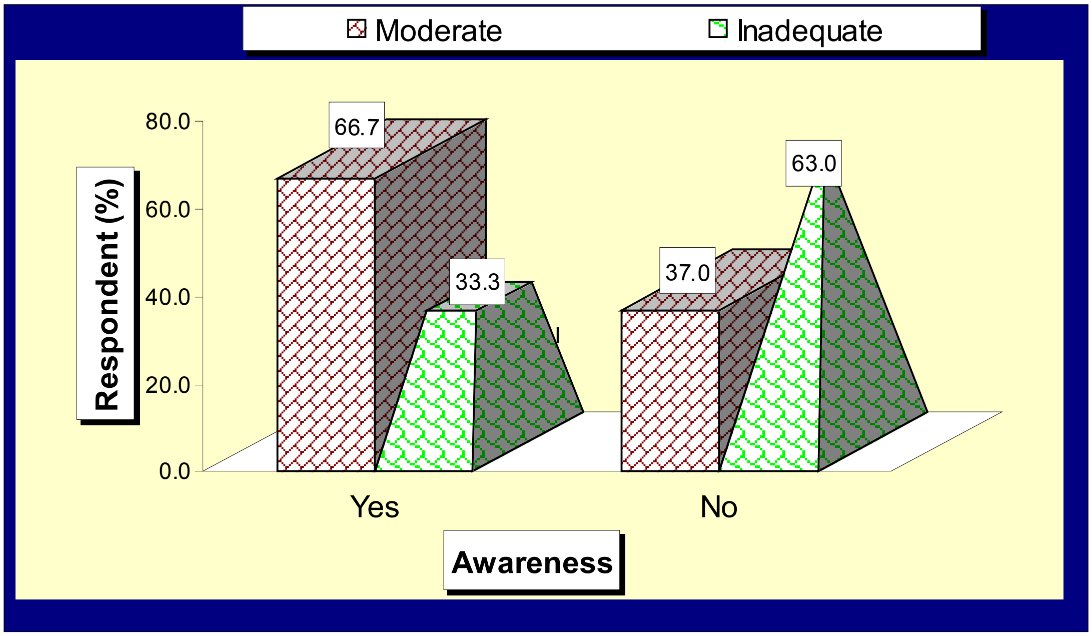

Figure.2: Classification of respondents as per association between awareness on coronary artery disease aspect and post test, pre test knowledge level on life style modification was significant at the level of 5%.

Over all Pretest and Post test Mean Knowledge on Life style modification

n =60

Aspects	**Max. Score**	**Respondents Knowledge**			**Paired 't' Test**
		Mean	Mean (%)	SD (%)	
Pre test	40	20.19	50.5	13.1	**16.71** *
Post test	40	30.61	76.5	11.9	
Enhancement	40	10.42	26.1	12.1	

* Significant at 5% level, **t (0.05,59 df) = 1.96**

The table-1 reveals that the enhancement mean percentage obtained for overall knowledge was 26.1% with 't' value of 16.71% at p< 0.001 level of significance. The calculated chi –square test results if 16.71 is higher than the critical value 1.96. Overall mean post test knowledge score 76.5% was higher than pretest knowledge score 50.5%.

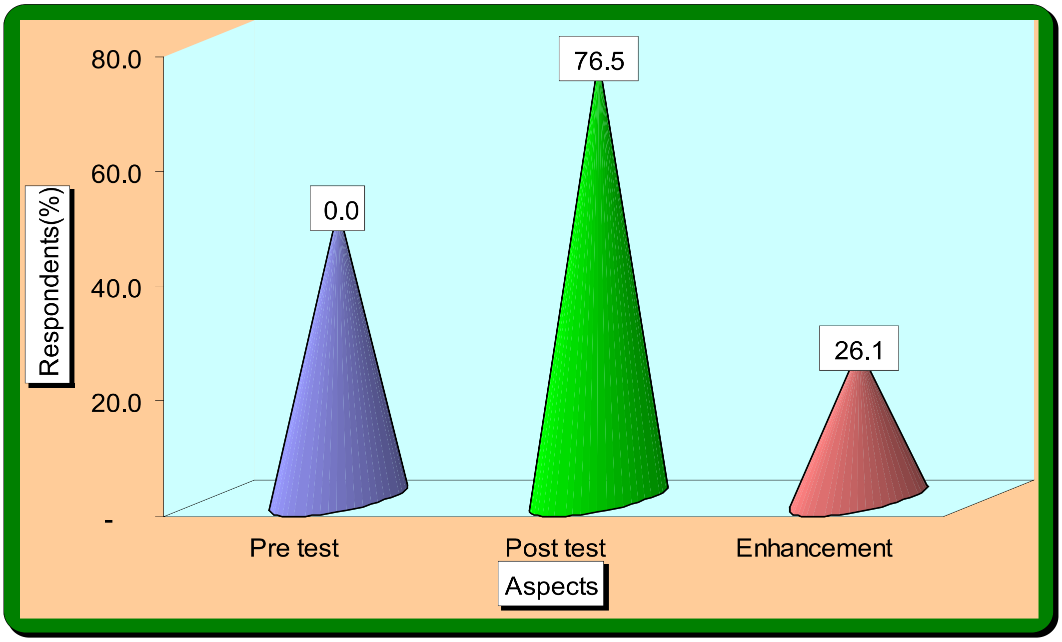

Fig 3.Over all Pre test and Post test Mean Knowledge on Life style modification

Discussion

The study revealed that Overall, a majority of participants lacked the predefined good level of knowledge pertaining to modifiable risk factors. In the comparison of pre and post test knowledge on LSM for maintaining healthy heart in cardiac patients revealed that the overall knowledge enhancement mean was 26.1 with standard deviation 11.9. The paired't' test value was 16.71, which is highly significant at p <0.001 level of significance.

The present study findings are similar to others, Xavier. D et al (2008), Almas .A et al (2008) mean age of patients was 57.5 and other associated illness like diabetes 23.7%, hypertension 40.2 % and 40.2 % were smokers indicating the higher rate of coronary artery disease in Indians attributable to life style changes. The identification of some of the risk factors of CHD has led individuals to realize that they have control of their own lives; that they have some power over their health status Ahmed.H, Khan .H (2007).

Large scale efforts to improve general awareness about coronary artery disease and its risk factors and to promote healthy lifestyles should be undertaken and the consumption of tobacco products and unhealthy foods discouraged. Karthikeyan G(2007). Similarly modifiable risk factors are actually the corner stone in the prevention of coronary artery disease hence more seminars on awareness of risk factors of heart disease are required as an urgent need to target educational strategies to the population as in the present study (Muhammad khan et al (2006).

Although CABG surgical procedure is not curative at the same time, when life style changes of risk factors are followed through more extensive and improved visual, formal, structured, individualized cardiac teaching program as in the study becomes a means of improving both the quality of life and the prognosis, Purcell (2004), Mckenna. K (2008), Engeibrech et al (Dec 2008), Singh(2005),

Conclusion

Life style modification is an essential weapon and beneficial to delay the progression of CAD, through which certain personal habits and risk factors comprising the health of heart are to be made major targets in the young people to lead a healthy life style. An ounce of prevention is worth a pound of cure—and that's especially true for cardiovascular disease-SJICR.

The study findings shows that there is significant improvement in knowledge of LSM, STP has enhanced the knowledge of cardiac patients regarding life style modification for maintaining healthy heart. The Cardiac patient expressed that the teaching programme was very informative and it would help them to modify their life style as appropriate to maintain optimum level functioning their heart. Hence the STP is instructionally effective, appropriate and feasible.

Implications

- Clinical Nurse Specialists can take the lead in constructing generalized teaching plans to be utilized in all hospitals to ensure that all cardiac patients are receiving the same adequate information.
- nurses must receive adequate preparation and training on communication skills that would help them to impart knowledge to the cardiac patient that is specific, informative and individualized
- Public awareness can be created by various community health programmes especially for those less educated, from rural areas where there is gradient of urban to rural prevalence of CAD in the present days.

Limitations

- The study findings cannot be generalized as the sample size was only 60
- The study was limited to cardiac patients who were admitted at Jayadeva institute of cardiology.

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2050 Vision for Health Research – a strategic plan for the future based on our past and present experience

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Abstract

Health research is one of the important pillars contributing to the scientific and professional knowledge that can impact the overall well-being of the population. In Oman, Ministry of Health (MoH) takes on the largest share of responsibility of providing health service to its citizens. Although there has been progressively increasing investment and commitment to research activities in the recent National 5 Year Plans, it still lags behind in the quality and quantity of research output. This situation is not unique to MoH or to Oman as a country, but all countries in the GCC and the EMRO Region have lower research output than most other developed and even some developing countries.

Lack of various factors like adequate infrastructure, dedicated human resource, empowerment of existing systems, societal support for research etc are all factors that have adversely affected research output. Ministry of Health and Oman as a whole has several strengths and opportunities that could be exploited to advance health research in Oman. Having realized the importance of indigenous research for enhancing health care, health service and health delivery, the Ministry of Health was mandated to propose a strategic plan to strengthen health research in Oman. This plan is referred to as *"Health Vision 2050 for Health Research"* with the vision to make Oman the regional leader and a research hub of world standards in health research for a healthier nation. The mission for this strategic plan is to promote, facilitate and conduct high quality health research in Oman addressing national health priorities in order to improve health care services and enhance the efficiency and effectiveness of the health system, reduce health inequity, and contribute to socio-economic development.

The strategic plan to achieve this vision are through setting health research priorities, strengthening health research capacity, defining and implementing norms and standards, developing health research (quality and quantity), translating evidence into policy, strategy and practice, monitoring and coordinating research, financing health research, and evaluating effectiveness of the health research system. All the necessary inputs including the creation of specialized research facilities with dedicated staff to achieve these objectives will be in place. It is anticipated that *2050 vision for health research*, will be a multifold increase in the quality and quantity of health research in Oman that will positively impact health system throughout Oman especially in all the identified priority domains.

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Introduction

Health research has been defined as the process for obtaining systematic knowledge and technology that can be used for the improvement of the health of individual groups. It provides the basic information on the state of health and disease of the population; it aims to develop tools to prevent, diagnose, cure illness and mitigate its effect and it attempts to devise better approaches to health care for the individual and the community.

Research improves health in three main ways. Firstly, it results in the development of new and better interventions in the form of both medical products (e.g. drugs, vaccines, diagnostics, and devices) and improved process to strengthen health service delivery, ultimately contributing to universal coverage with essential health care. Secondly, it informs the development of effective policies and practices and, finally, it empowers people and individuals to internalize knowledge and practice health behaviours in their daily lives. Knowledge and research alone are insufficient to be a force for change without two other critical components, namely, the political commitment and social movement.

Whether private or public, for-profit or not-for-profit, health and medical research contributes to health both directly (through the therapies, interventions, diagnostics, technologies and quality improvement in health-care delivery that result from research) and indirectly, through the potential impact of improved health on economic activity, because of the prospective economic benefits of health research itself and because it assists in creating and maintaining a culture of evidence and reason.

Categories of Health Research

Health research is a broad term that covers many types of research and no attempt has been made to come up with a single system for categorizing it. Instead, it is multidimensional and can be categorized in many ways, for example, as biomedical; clinical; public health; basic; applied; researcher driven; health system driven; quantitative; and qualitative[1].

To make it simple, health research can be classified into two broad categories:

Disease Specific and Risk Factors Health Research

This category includes:

- Biomedical research
- Public health research
- Environmental health research
- Social sciences and behavioural research
- Science and technology research

Non Disease Specific Health Research [Health System Research]

In this category, the main focus is on the health system, the process and the output from the point of view of the system provider.

Definition of Health System Research (HSR)

Health systems research can be defined as the type of research that addresses the six building blocks (which are 1.Service delivery, 2.Information support, 3.Leadership and governance, 4.Health workforce, 5.Financing and 6.Health technology) of the health system and policy issues that are not disease-specific but concerns systems problems that have repercussions on the performance of the health system as a whole. It addresses a wide range of questions, from health financing, governance, and policy to problems with structuring, planning, management, human resources, service delivery, referral, and quality of care in the public and private sector[2]. Health systems research exists in order to improve the quality of health service delivery.

Goals of Health System Research (HSR)

Health systems research aims to provide information which when acted upon will improve the functioning (process) of the health system, and ultimately lead to improve health status (output). All health systems research should be used to appraise policy makers. It provides policy options and practical information to role players in the health system. These role-players may range from policy makers at a national level to clinic managers at the primary care level. Health systems research can be considered as a type of applied health research[6].

Categories of Health System Research

Operational Research: looks at the actual delivery of health services. It examines the resources and processes used by the health services and the outputs they attain. Operational research aims to improve health service delivery by providing practical answers to the questions asked by managers of the health services. In addition, the findings or recommendations of operational research may be drawn upon by policy makers or policy researchers to assist them in formulating and evaluating health policy[6].

Health Policy Research: These refer to health system researches which are not carried out at service delivery level and which are more explicitly aimed at informing higher levels of health policy choices. An example of this is research into resource allocation between levels of care or geographical areas, such as the funding formula for the division of the health care budget between provinces or between sectors[6].

WHO Strategy on Health Research

The WHO strategy on research for health represents international recognition that global improvements in health are dependent on quality research that is approached from a global perspective[4].

The guiding principles of the strategy are **quality** (i.e. research that is ethical, expertly reviewed, efficient, effective, accessible to all, and carefully monitored and evaluated), **impact** (i.e. research with the greatest potential to improve global health security, accelerate health-related development, redress health inequities and help attain the Millennium Development Goals), and **inclusiveness** (i.e. partnership, a multi-sectorial approach, the participation of communities and civil society in the research process) [4].

Goals of WHO Strategy

There are four key building blocks to strengthen research in countries[4] are demonstrated in figure 1:

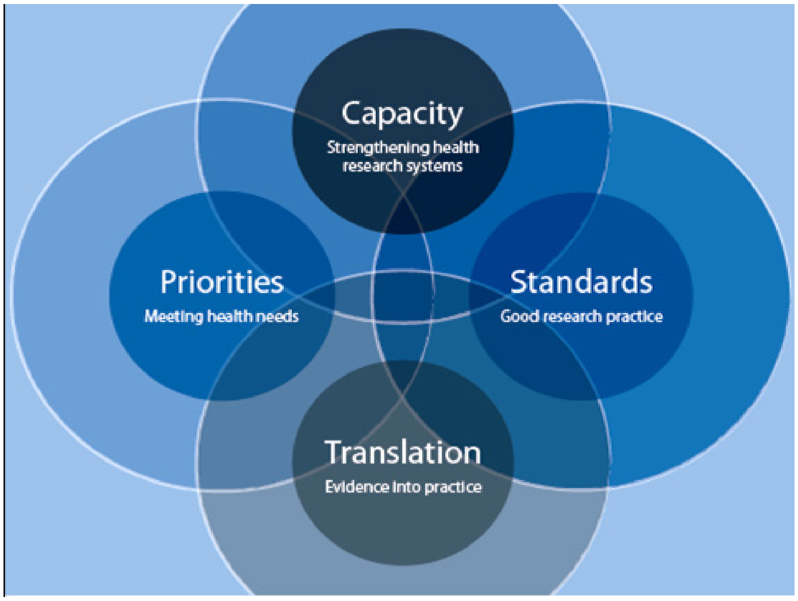

Figure 1: WHO interrelated goals on health research[4]

Health Research System

Good health research needs good health research systems

Definition of Health Research System (HRS)

It is a system for planning, coordinating, monitoring and managing health research resources and activities; and for promoting research for effective and equitable national health development[5]. The definition of health research systems proposed by the WHO is: “the people, institutions and activities whose aim is to generate detailed and reliable knowledge that will be used to promote, restore or maintain the health status of populations” [6].

HRS improves the health of the community by enhancing the efficiency and the effectiveness of the health system which impact the overall process of socioeconomic development.

Context of Health Research System

Three broader systems are interlinked with the health research system of a country: the health system itself, the education system, and the science and technology system These systems are influenced by the country context, including the historical, political, ideological, socioeconomic, geographical and cultural factors at play in the country[5]. The interaction of these systems with each other and with the prevailing environment eventually shapes the health research system, which is then further influenced by the international research community

Why do we need a Health Research System?

There are several reasons for a country to adopt a systems to health research[5]:

- In many countries especially low/middle income countries; health research is uncoordinated and fragmented, resulting in inefficiencies and duplication. A systems approach would better coordinate this research.
- Some research requires collaboration and linkages between different research organizations or disciplines. A system would be able to create the required synergy between these entities.
- In many countries especially low/middle income countries, research is inadequately linked to the priorities and goals of the health system. A systems approach would better align health research with national health priorities and goals.
- Many research outputs are not adequately translated into changes in the health system, or into the desired health and equity outcomes. This points to a need for a more systematic application of research in policy, planning and delivery, as well as a more systematic link between researchers and users of the research.
- A systems approach is needed to develop research capacity and to mobilize resources for research and development.
- Health research in many countries especially low/middle income countries is sometime unethical, unfair, unaccountable and not transparent. Countries need to develop systems approaches for setting rules, procedures and standards, and to regulate themselves in line with expressed values and principles.

National Health Research System (NHRS)

Although research is often portrayed as neutral or objective, knowledge and the road from knowledge to effective health action are certainly not. For that reason, research systems need to take into account the specific nature, culture, history, capabilities and preferences of countries. In short, research systems are highly country-specific. There is no general system that works; there are only concepts and values that need translation into local realities[6].

Functional Component of National Health Research System

The main functional components of the national health research system are as follows[4-7]

- **Stewardship (governance):** This includes definition and articulation of a vision for a National Health Research System; identification and adherence to appropriate health research priorities; setting and monitoring of ethical standards for health research; and monitoring and evaluation of a health research system itself.
- **Financing:** Securing research funds and their allocation according to the vision and agreed priorities with accountable disbursement of funds is a central function of health research systems.
- **Creating and sustaining resources:** these deals with bringing new researchers and institutions into the system and further developing and sustaining the existing human and physical resources to conduct, absorb, and utilize health research as well as provide appropriate facilities and a favourable and conducive environment for research.
- **Producing, synthesizing and utilizing research:** This refers to the publication of the results of research in scientific publications. It also includes communicating and promoting the utilization of research to influence health policies, strategies and practices within the health system.

Figure 2: Functional component of the National Health Research System

Current Status and Situation Analysis in Oman

Overview of Research in Oman

Oman strives to be the regional hub of research and innovation covering a wide array of disciplines ranging from biological and health sciences to engineering, social sciences, humanities and economics bearing in mind the strong social and cultural integrity of the country. The avenues for research in Oman originate from different ministries of the government (such as the Ministry of Health), private and governmental Universities (such as Sohar University and Nizwa University), research funding bodies such as The Research Council (TRC) and non-governmental organizations like the Environment Society of Oman. Health research in particular is not only conducted by the Ministry of Health but other institutions linked with medicine and health sciences (for example Sultan Qaboos University, Nizwa University, Sohar University, ….etc.).

There is a high political commitment to develop health research and this is manifested clearly in the structure of MOH which has a separate Directorate of Research & Studies.

The routine activities of the Directorate includes the advisory support to researchers in the MOH, review and approval of research proposals submitted to Research and Ethical Review and Approve Committee (RERAC) from the capital and other regions, setting research priorities, follow the five year plan for research, cooperate and coordinate with other local and international research bodies and conducting workshops and other training programmes in Research Methodology and Ethics and Statistics for health professionals to list few.

Status of Health Research Publications and Its Utility in Oman

The research work in health related fields in Oman were assessed using the following three criteria:

a. Health Research publications in the Sultanate of Oman (Quantity & Quality)
b. Research findings being implemented into policy in Oman

Health Research Publications in the Sultanate of Oman (Quantity & Quality)

Most of the health researches and community surveys ended up as official reports to health authorities, but few of the studies were published in scientific journals. Therefore, publications in peer-reviewed journals are not reflecting all the research output.

The Table below[8] shows the overall publications in medicine, where Oman ranks ninth among the fifteen countries in the region. The number of published documents (quoted in brackets) are quite low compared to other countries in the region:

	Country	Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
1	Turkey	93,563	84,175	480,821	94,122	6.25	120
2	Iran	23,189	21,587	78,508	23,937	7.01	68
3	Saudi Arabia	12,333	11,124	77,284	9,499	6.73	81
4	Egypt	10,512	9,890	70,050	7,419	9.05	76
5	Lebanon	4,145	3,557	30,059	2,697	8.84	61
6	Kuwait	3,110	2,949	21,491	2,383	7.61	49
7	Jordan	2,809	2,671	15,132	1,251	6.47	46
8	United Arab Emirates	2,781	2,463	18,421	1,629	7.62	46
9	**Oman**	**1,522**	**1,327**	**7,357**	**676**	**5.53**	**30**
10	Qatar	1,177	1,078	4,454	468	4.84	25
11	Bahrain	1,074	941	3,488	463	3.89	24
12	Iraq	1,063	924	3,422	342	4.48	24
13	Syrian Arab Republic	405	367	3,372	365	11.09	28
14	Yemen	367	346	1,530	251	4.95	18
15	Palestine	331	306	1,745	285	9.91	19

Table 1: Subject category: Medicine (overall)

It has to be accepted that both the absolute number of scientific publication and also the per capita (based on the population) are low from Oman. The following graphs show the situation.

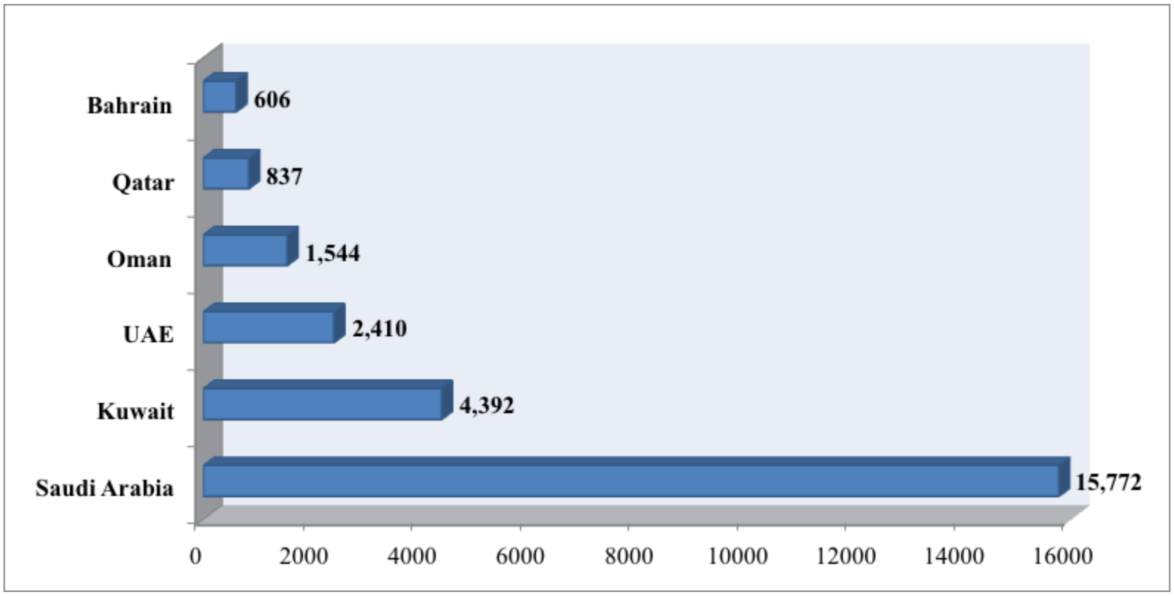

Figure 3: Absolute numbers of publications retrieved from Medline database over the period January 1970 to October 2010 [9]

On comparison across countries for the period 1970 to 2010[9] giving the average number of publications per million population

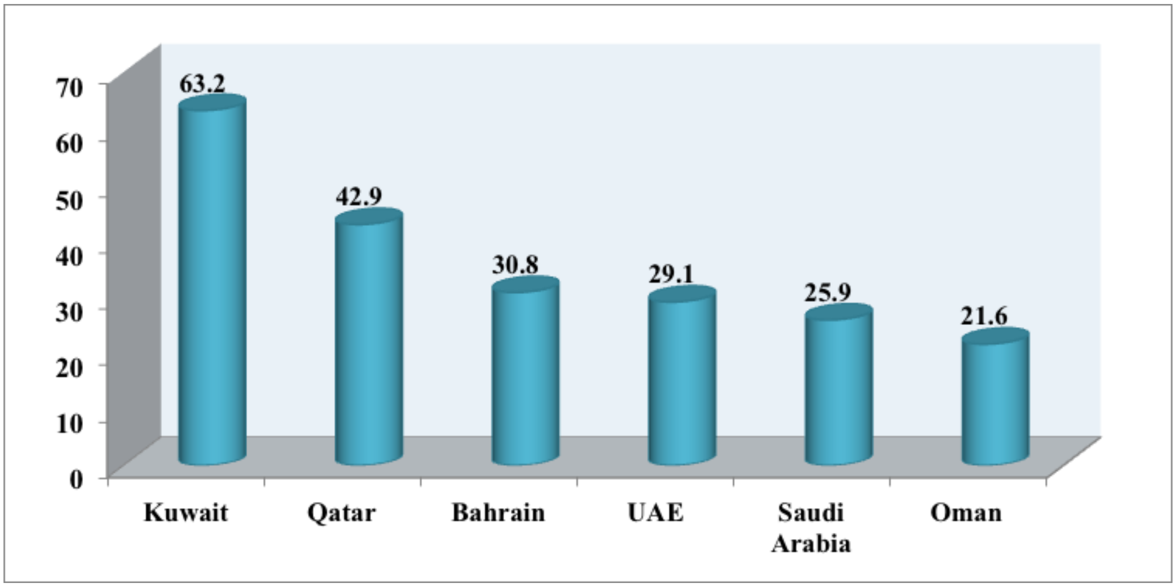

Figure 4: Average numbers of publications per million populations (PPMP) per year over a 40 year period from 1970 to 2010 [9]

(PPMP), gross domestic product (GDP) and physicians per 100 publications, Oman was trailing behind on all the three indicators (Figure 5).

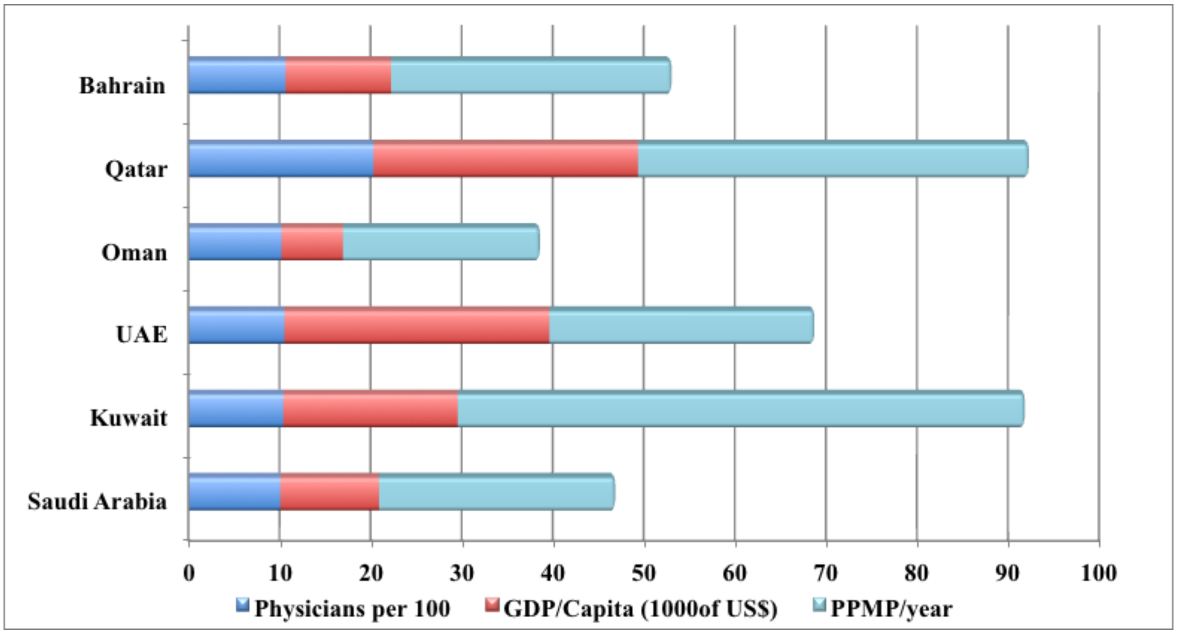

Figure 5: Average number of publications per million population (PPMP), gross domestic product (GDP) and physicians

Figure 6, illustrates the distribution of journals with various impact factors (IF) in which biomedical publications from Oman were published in years 2005-2009[10]. More than a quarter of the publications in all five years appeared in journals having no IF and more than half of all the publications were in journals having IF of <1. The study concluded that though the number of publications emanating from Oman increased over the last five years; the quality of research has not improved.

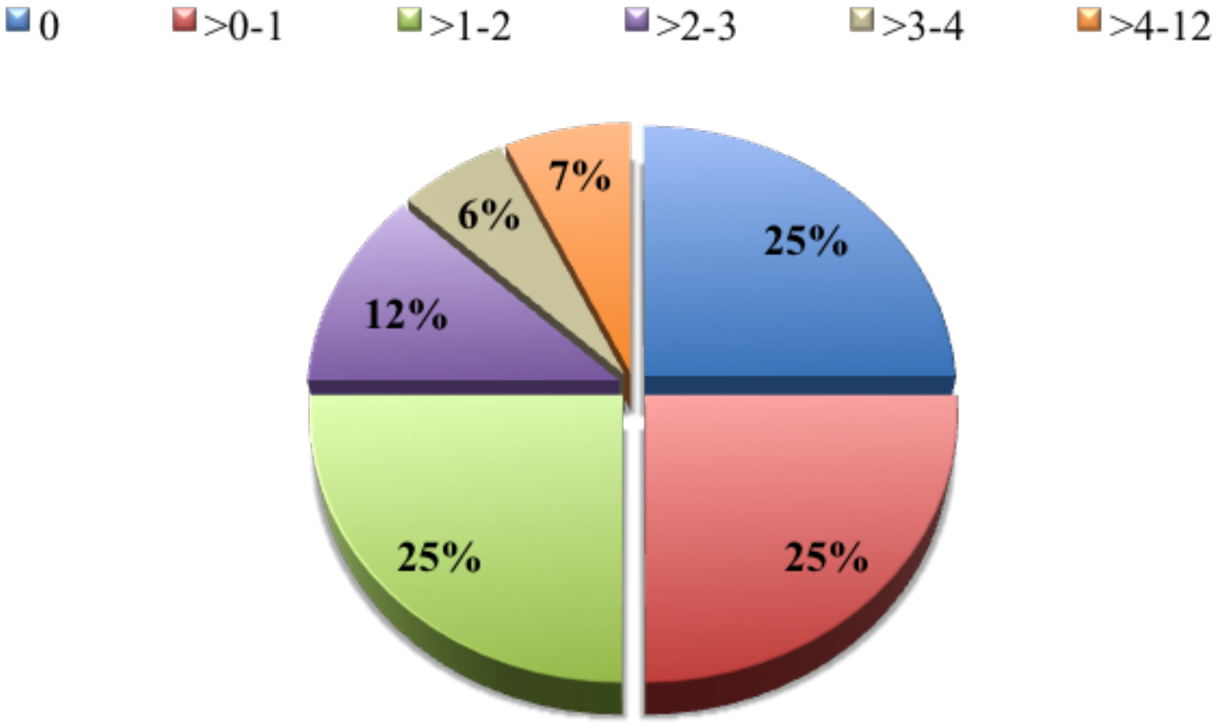

Figure 6: Journal Impact Factor for biomedical publications from Oman (2005-9)

Translation of Health Research into Policy and Practice

This issue should be taken into consideration as the success of any research organization or country should not only be measured by the number of researchers or number of published papers but also by implementation and appropriate utilization of research findings. Until now the translation of research finding into policy in Oman has been limited. There has to be a system and process by which good quality research done within the country is translated into policies and operationalised for the benefit of the population.

CHALLENGES AND PROBLEMS OF HEALTH RESEARCH IN OMAN

Clear knowledge and understanding of the strengths and an appreciation of the weaknesses in the current system is important to make progress. The chart below lists the main strengths of the system and the corresponding challenges. By addressing these challenges, significant improvements can be achieved.

STRENGTHS	CHALLENGES
Existence of Directorate of Research and Development (R&D) (1991) but mainly surveys conducted	Insufficient research to address gaps, MoH priorities, Health System Research and needs
Existence of components of National Health Research System (committee, plans, priorities)	Update mapping and limited profiling, performance assessment to provide information about health equity No HSR, No Health Performance System Assesment
Well-developed Health Information System	Inadequate system to incorporate research into decision making processes
Availability of research infrastructure in MoH institutions (State-of-the-art labs, hospitals, Oman Medical Juornal)	Inadequate reseach conducted in MOH institutions
Qualified National Researchers (PhD and clinicians)	Limited academic collaborations for MSc and PhD programs with internal and external universities Limited budget for health Research In MoH
Research and Ethical Review and Approve Committee (RERAC)	Insufficient coordination of research activities between MoH and academic institutions No national code of ethics No research observatory
Existence of the health research domain in the five-year plans of MOH since the 6th plan (2001- 2015)	Inadequate adherence/non-adherence of academia and national programs to address health priorities No Health System Research (HSR) Poor cordination between stakeholders

Figure 7: Summary of the strength and challenges of health research in Oman

International Experience

Oman is striving to become a country of high quality in the field of research. The most important challenge is to facilitate the translation of research results into healthcare measure and policies by reducing frictions between research cultures, bridging gaps, overcoming existing hurdles, taking into account social, cultural and ethical values, thereby fostering more interdisciplinary cooperation.

In developed countries; A good example of this is the German health research system [11] (figure 8). German researchers are important partners in international projects and have repeatedly received major research awards.

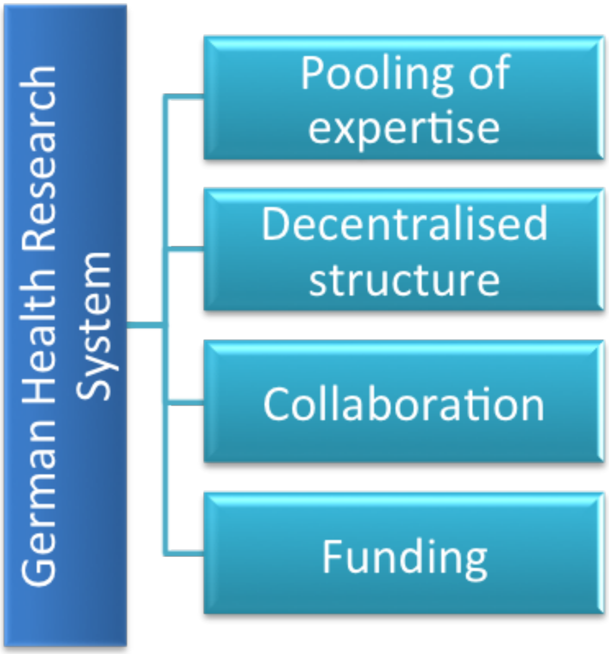

Figure 8: Four key factors of the German health research system model

In developing countries;

- South Africa: Example of a country in which the health research system was influenced by the political environment
- Cuba: Example of a country in which the health research system is decentralised and based on national priorities (based on morbidity and mortality data)
- Georgia: Example of a country in transition and how this influences the health research system
- Thailand: Example of a country in the process of reforming the health research system
- Malaysia: Example of a country with better governance, coordination and harmonization.

Key Message for Oman from The Experience of a Developed Country

Oman can incorporate some valuable lessons from the German health system and can adapt them in the context of its own strong culture, heritage and vision. Cooperation and pooling of expertise between different institutions, academic and non-academic such as MOH, SQU, TRC and the various hospitals would help strengthen to a great extent the Health Research System in Oman. Identifying gaps along with collaboration from relevant public and private stakeholders can further strengthen Oman in the field of health research[11].

Key Message for Oman from The Experience of Developing Countries

The experience of developing countries like Thailand and Malaysia will be useful for Oman for identifying ways to enhance the system and avoid the pitfalls. For example, the Thailand experience identified few problems like inefficient fund management, inadequate investment in research, lack of common goals, long proposal processing time etc[12]. These could also happen in Oman unless there is an efficient management system, competent monitoring process and dedicated personnel.

Funds for research are always less than the demand and in both Malaysia and Thailand as in all developing countries, Government has to bear the major financial burden for health research. Oman is in the same situation now as most of the funding for research comes from various governmental agencies but as a long term strategy to reduce the burden on the government, involvement of private agencies and non-governmental organizations in health research as part of their social commitment will be an important strategy. The Malaysian experience of bringing all research agencies under one umbrella is a valuable lesson to learn. Multiple organizations doing research independent of each other will make the system less efficient because of unnecessary duplication, varying standards, excessive overheads, inadequate monitoring, un-coordinated prioritization, vying for funds from same sources and even unhealthy competition. Prioritizing domains of research is also an important step that Oman has already adopted.

2050 Vision for Health Research

To correct the shortcomings of the past, make up the deficiencies of the present, to consolidate on the achievements thus far and to reach a high standard of research output in the future, a well defined strategic plan with appropriate time line has to be in place. The *Health Vision 2050* is a step in this direction.

Vision

Oman to be a regional leader and a research hub of world standards in health research for a healthier nation.

Mission

To promote, facilitate and conduct high quality health research in Oman addressing national health priorities in order to improve health care services and enhance the efficiency and effectiveness of the health system, reduce health inequity, and contribute to socio-economic development

Strategies

In order to achieve the vision and mission, a set of strategies that are specific, measurable, and achievable have to be set. The strategic goals can be broadly classified under the following headings:

Strategy 1: setting health research priorities
Strategy 2: strengthening health research capacity
Strategy 3: defining and implementing norms and standards
Strategy 4: developing health research (quality and quantity)
Strategy 5: translating evidence into policy and practice
Strategy 6: monitoring and coordinating research
Strategy 7: financing health research
Strategy 8: evaluating effectiveness of the health research system

The Way Forward

Each of the above mentioned strategies have many specific activities to be implemented to achieve 2050 vision and mission.

Strategy 1: setting health research priorities

MOH research priorities have been identified, and to ensure the adoption of these priorities many steps have been taken. For this purpose, the priorities have been distributed to all health and educational institutions and postgraduate students are encouraged to select topics from this list. The main areas for MOH priorities include:

1) HEALTH SYSTEM RESEARCH
2) HEALTH RESEARCH RELATED TO DISEASES AND RISK FACTORS:
    - ✓ Non-Communicable Diseases (Figure 9)
    - ✓ Congenital anomalies
    - ✓ injuries
    - ✓ Problems related to aging
    - ✓ Disabilities and rehabilitations
    - ✓ Communicable diseases
    - ✓ Perinatal & Malnutrition
    - ✓ Child and maternal health
    - ✓ Health promotion

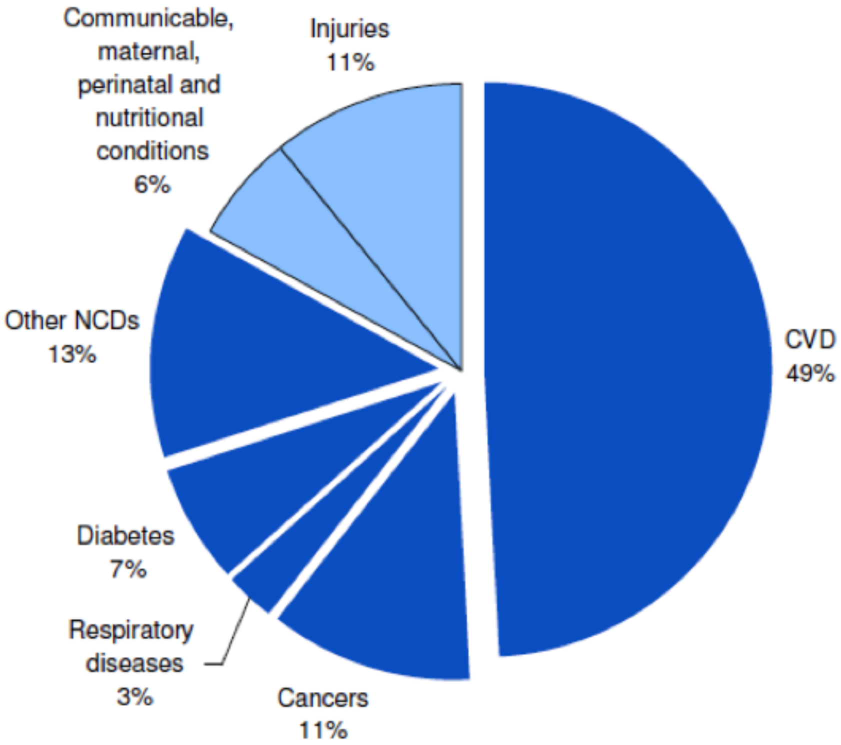

Figure 9: Proportional mortality for Sultanate of Oman (% of total deaths, all ages) -WHO, 2011.

Strategy 2: strengthening health research capacity

The term “capacity” could refer to all elements of a research system. But here it means the abilities of individuals, institutions and networks, nationally and internationally, to undertake and disseminate research findings of the highest quality. Strengthening health research capacity can be done through:

- Establishing a **Centre for Research** which has a well-defined and unique responsibility at the national level in the conduct and supervision of research is of prime importance.
- Establishing a Research Hub of world standards which will be in co-ordination and collaboration with other agencies within Oman which are also involved in conducting, facilitating and supervising research in the field of health.
- Training of researchers in Research Methodology, including a comprehensive understanding of Bio ethics, Biostatistics, Health Economics, Computing and data management as well as training of trainers such that a critical mass of competent.
- Spreading research culture in Oman by offering various incentives to encourage health care professionals to conduct research.
- Enhancement of professional skills by providing Continuing Medical / Professional Education (CME) and awarding qualifications in collaboration with academia.
- Promoting the social accountability through better engagement of communities in Health Research, mainly by involvement of members from the community in the policy making bodies for the translation of evidence from research into action plans and policy making.

Strategy 3: defining and implementing norms and standards

High quality research can be assured through proper documentation and implementation of international standards of god research practice, and to reach that level MOH have to do the following:

- Establishing national code of ethics to protect the researcher rights as well as the research subject.
- Documenting and archiving the list of all researchers, research proposals, reports and publications and all aspect related to the research.
- Registering clinical trials to inform the decision maker about all of the available evidences.

Strategy 4: developing health research (quality and quantity)

Many reports have shown that original research arising from GCC counties including Oman is low. Ministry of Health is the main health service provider in Oman and hence research on health service and health system needs to emanate significantly from MoH. Research has been introduced as one of the main pillars as per the 8th Five Year Plan and hence the Ministry should identify measures to increase the quality and quantity of research, implement the feasible options to achieve it and evaluate the impact of research in modifying health care and health system . The quantity and quality of research and scientific publication by staff employed by MoH can be strengthened by the following broad set of attributes:

- Generating Motivation to enhance research activity.
- Providing Incentive to increase and encourage research.
- Enhancing Research Skill by training and higher qualification.
- Selecting the right material at recruitment
- Specifying a career path for research oriented professionals
- Adjusting the time factor for research
- Enhancing Electronic Clinical Record System to be research friendly and allowed extract the information or the data required for research in a systematic way.
- Providing access to the World Wide Web

Strategy 5: translating evidence into policy and practice

This implies the translation of research findings into policy and practice guidelines at the different levels (strategic, executive and operational). To achieve this goal we have to start with researchers who have to generate high quality research on priority issues. The decision makers have to utilize the evidence generated by the researchers by making policies and practice guidelines. This can eventually improve health in the community.

So Research knowledge translation and dissemination of research outcomes (knowledge transfer and exchange) can be done through:

- Comprehensive website for the Directorate/ Centre for health research Electronic submission of progress and final reports
  - News and events of the activities
  - Training opportunities, national, international and online courses
  - Research reports using a search engine by disease or topic
  - Research articles or publications using a search engine by disease, topic, or author name
  - Links to other professional sites on related topics
- Establishing a newsletter and/or medical journal from the Directorate Center for health research.
- Periodic meeting with policy makers, managers, academia & TRC to disseminate results on the format, periodicity, nature of content and other specification of the publication.
- Encouraging researcher to publish their studies in indexed journals
- Policy briefs
- Encouraging oral presentation and posters of research data at national and international conferences and workshops
- Periodic and regular conference with national and international participants
- Access to international search engine to access international journals and citations (Science Direct, PubMed etc.).
- Subscription to printed/online scientific journals dealing in Research Methodology, Biostatistics, Bioethics, health Economics, Clinical Epidemiology and related journals.
- Yearly evaluation of progress reports of the Directorate/ center for health research

Strategy 6: monitoring and coordinating research

Monitoring and coordinating research mainly can be achieved through two main aspects:

- Co-ordinating, networking, and collaboration with other health institutions and academia for the advancement of research capacity.
- Establishing a Research and Development Observatory, which focus on monitoring progress and development, and actively gathering and displaying information about a specific cause. The goal of the Research and Development Observatory is to facilitate evidence-informed policy and practice of research for health, by providing all relevant information and making it available to stakeholders.

Strategy 7: financing health research

Health research is more productive when there is a guaranteed, regular availability of funds..

A more recent recommendation of the WHO is that “developing” countries should commit 0.05–0.1% of GDP to government-funded health research of all kinds. Higher-income countries should commit 0.15–0.2% of GDP. To achieve these recommendations the following should be considered:

- An international mechanism should be established to monitor progress on the financial and technical support provided for health research in developing countries.

- The Centre for Health Research has to have a corpus of fund for disbursing for approved research.
- The MoH will have to provide and sustain this fund from its budget as the Directorate of Research is not an income generating entity but is only a service provider and its customers are currently only the MoH. However in future, by expanding its clientele beyond MoH, some income may be generated from its training programme, consultative services, donations from philanthropic individuals and organizations and even from patents that may come from research funded by the Centre.

Strategy 8: evaluating effectiveness of the health research system

The evaluation of health research system effectiveness is very critical issue to ensure the success of the program and to assess the impact of the conducted research in come over the challenges and problems faced by the health system and decision makers. Some of the aspects to be taken in this area are:

- Monitor and evaluate the use of research results by the national control programme and its impact on disease burden and health services.
- Develop a system for detecting and dealing with scientific misconduct
- Requesting the receipt of raw data to verify the analysis and/or to carry out an in-depth analysis
- Registration of the ethical review committees and randomised controlled trials.
- Monitoring and validation by local supervisors / administrators

Conclusion

Research has been the corner stone in the development of innovation, and technology in the past, and research will continue to be critical in health care not only in improving health and quality of life but also in the appropriate application of newer technology and innovation. To this end, the Ministry of Health through its *2050 vision for health research* hope to achieve the vision it has set in its target. It is equally important to adapt to the changing scenarios in health service from time to time and with the needed course correction will meet the need and overcome the challenges of the next 40 years.

Knowledge of the past and present problems and challenges enabled us to draw the strategic plan which will hopefully be a corner stone to achieve *2050 vision for health research.*

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Health Information Diffusion among Arab American Women: Understanding Barriers to Improve Access to Breast Health Education

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Abstract

Background

An estimated 5.1 million Arab American immigrants live in the United States, with a high proportion residing in New York City. Although the community of Arab Americans is large and growing, public health literature on generational differences in receipt of breast cancer information in this population is minimal.

Objective

This study examines the breast cancer information seeking practices of Arab American women in New York City, with attention to differences between generations. Results will be used to determine how to best deliver breast health information across the generations in this population.

Method

Four single-gender focus groups were conducted with 47 Arab American women in NYC using Colloquial Arabic-Levant Dialect. These sessions focused on generational differences between mothers and daughters and barriers to obtaining health information. Audio-recordings were transcribed, translated, coded using ATLAS.ti 6.2, and analyzed for themes.

Results

The data demonstrated the younger generation's increased access to breast health information, and identified barriers and important attitudes around health information dissemination among Arab American women. This study identified an important area for a potential channel of breast cancer information dissemination among this population.

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Discussion

While this study addresses a major gap in the immigrant health literature, more research is needed among Arab Americans across the United States.

Introduction

While health data on Arab Americans in the United States (US) are quite limited, even sparser is research on Arab American sources of health information [1]. Approximately 5.1 million Americans are of Arab descent, including recent immigrants to the US and US-born descendants of immigrants [2]. Since 1980, the number of New Yorkers who identify as Arab has more than doubled to a current population of 449,187, among the fastest growing Arab populations in the country [2]. The number of Arab American youth under 18 years of age is also growing, representing 27.8% of the Arab population in New York City (NYC) [3].

There is variation in education and socioeconomic indicators among Arab Americans in NYC. For example, NYC Department of City Planning data show that only 55% of Yemeni-Americans reported completing high school compared to 91.8% of Egyptian-Americans [3]. Although Arab-Americans have a higher median household income ($56,433) than the national median ($51,914), there are financial gaps within the community [4]. A health assessment conducted in Southwest Brooklyn in 2010, the largest Arab American neighborhood in NYC, showed over 50% of households lived below poverty level and nearly 30% had no health insurance [5].

Studies show that, in general, health education is sought outside of clinical sources, and that those who are not literate and who are without access to the Internet, particularly older generations and those who lack a formal education, have little access to health education [6]. Compounding this problem for the Arab American population is the dearth of culturally and linguistically appropriate health information available [7], although health needs assessments conducted in both California and NYC revealed that health education is a priority for this population [8, 9].

While national surveys suggest that a large percentage of Americans as a whole rely on family and close friends for health information [10], Arab Americans are far less likely to turn to these “lay interpersonal health information sources,” especially after receipt of a diagnosis of a serious illness such as diabetes or cancer [7,10]. One possible explanation for this is the heavy burden of stigma and shame associated with certain illnesses for the individual and for the family [7,11].

Breast cancer is the leading cause of death among Arab American women and it occurs at a younger age than for women of European descent [12, 13] and with more aggressive disease [13]. Arab American women are less likely to be screened for breast cancer, even in the face of heightened risk, because of a lack of knowledge about the disease and lack of access to screening services [7, 14]. Evidence-based breast cancer education is crucial for this at-risk group.

Objective

To determine how to best deliver breast health information across the generations in the Arab American community, four single-gender focus groups were held with mothers to explore health information sources and how information is communicated across generations.

Methods

Study Design

A total of four 1-hour focus group sessions with 47 Arab American women were conducted in New York City from 2010 to 2011 by the Arab American Breast Cancer Education and Referral Program (AMBER). The number of focus groups conducted reflected saturation of common themes. This study was reviewed and approved by the Institutional Review Board (IRB). All sessions were conducted in Arabic using Kreuger and Casey’s methodology [15]. The sessions were hosted at Arab American community based organizations (CBO) in the Bay Ridge neighborhood of Brooklyn. Data analysis was conducted by a team of researchers with backgrounds in immigrant health, Arab American health disparities, epidemiology, and oncology. Four of these researchers were of Arab descent and fluent in Arabic.

The focus groups were administered in Colloquial Arabic - Levant Dialect and led by trained bilingual Arab American female facilitators, one a physician and one a health educator/patient navigator. All sessions were audio-recorded, transcribed and translated. Facilitators and recorders completed the IRB's HIPAA and Human Subjects Research online tutorials.

Participants

The inclusion criteria for study participation included: (1) Arabic speaking; (2) female; (3) self-identified as Arab American; (4) adult or older than 18 years old; and (5) had a daughter. Participants were recruited through the distribution of flyers at CBOs, churches, mosques, and at sites.

Data Collection

All participants were made aware of the goals and potential risks of the study and verbally asked to consent to participate in the study. The facilitator welcomed the participants, explained the goals of the study, introduced the recorder, and explained that the sessions were only being recorded to assist with the transcription. Participants were asked open-ended questions by the session leader and probed for further elaboration of their ideas. At the end of the discussion, the facilitator hosted an unrecorded education session where she addressed questions and issues raised during the sessions.

Measures

A focus group guide was developed to measure: (1(sources of health information sought by women and their daughters; (2) the dissemination of health information from mothers to daughters; (3) knowledge, beliefs, and attitudes regarding breast cancers; (4) the role of religion and stigmatization of disease; and (5) the impact of acculturation.

Analysis

All audio-recordings were transcribed verbatim in Arabic and then translated into English. Data was analyzed using ATLAS.ti version 6.2. All transcriptions were reviewed separately by researchers and an initial list of themes was generated referencing Unrau and Coleman for direction [16]. Collectively, the researchers discussed thematic findings, resolved any discrepancies in findings and created a shared list of themes. Those themes were then used as codes for ATLAS.ti. Transcripts were re-read with the assigned codes and coding disagreements were also resolved by consensus. Researchers reviewed the final themes to ensure that they adequately reflected the data.

Results

47 women participated. Forty percent of the women were above 40 years old. The women reported the following countries of origin: Algeria, Egypt, Lebanon, Morocco, Palestine, Sudan, Syria, and Yemen. The majority of the women were Muslim, with the remaining nine women identified as Christian. Most participants, 89%, reported they preferred their medical care to be delivered in Arabic; only 5 participants, all in the same group and who originated from Palestine and Lebanon, preferred information in English. The majority of participants, 66%, had lived in the US for less than two years. Fifteen percent of participants, also from the group of English proficient speakers, had lived in the US for over 10 years. Thirteen percent of participants, all in the same group, and who originated from Yemen, had received no education. Table 1 details the demographic composition of the focus groups.

Analysis of the four focus groups revealed several themes related to health information diffusion and generational differences between mothers and daughters among Arab American immigrants. Among the cohort, education levels, number of years in the US, language barriers, social stigma, male relatives, and spirituality had significant effects on the ways participants and their daughters received health information and accessed healthcare. Their beliefs regarding breast cancer included numerous etiological theories and strong notions of fatalism and God.

Generational gap in health information access and knowledge

The majority of participants in each focus group reported feeling that their daughters were more well-informed on health than they were. Further, mothers unanimously reported that their daughters had greater access to health information through formal and informal means, such as school and the Internet. One woman articulated, “Girls in their twenties should educate people older than them because parents did not receive the same information given to girls at school today.”

The women generally reported being pleased that their daughters had greater access to health information than they had when they were growing up. Women unanimously recognized that this access empowered their daughters to be greater agents in their own health. As one Egyptian Muslim woman stated,” I encourage teaching them about breast cancer and other health topics, in case our girls ever feel something strange or abnormal in their bodies; our religion encourages us to seek knowledge.” All of the participants agreed. One participant summarized: “Girls these days know everything… My daughter who is still in school reminds me to get breast screening tests, which is a cumbersome process in the US.”

Stigma of disease

Most women, irrespective of years in the US and English fluency, described a general reluctance to exchange health information regarding women’s health and cancer among friends for fear of social stigma. Many diseases were considered socially inappropriate, more so when it came to female sexual organs. Many women described feeling too afraid to discuss cancer: “There are some (Arab) people who stay living with cancer and even die before going for treatment because of extreme fear.” Consequently, the majority of women often did not discuss these conditions with friends or most family members including their own children, isolating it to discussions only with a few individuals like their spouses or their siblings . One woman stated, “When our people talk about cancer, they do not say the word ‘cancer’ but say ‘the disease’.” Most women reported that their daughters, however, are more likely to seek social support and health advice from friends. Social stigma with disease seems to be less present in younger generations: “Girls tell each other everything these days even before they tell their mothers or sisters.”

Sources of health information

Most participants identified close male relatives as having a role in how they receive health information. For many of the mothers, their husbands taught them much of what they know about sexual and female health. In fact, they described that this type of education was expected upon marriage. Most of the women reported being advised by their own mothers to seek out their husbands as a primary source for health education. One woman stated, “When I had a menstrual cycle for the first time I felt scared because I did not know anything, but after I got married I learned everything. I blame my mother because she did not teach me anything.”

Across the groups, all women criticized the deferral of health education until marriage, and many considered themselves to be the most appropriate medium of information for their daughters. One woman explained, “The mother is best to pass down such information, from one generation to the other.” Several women also reported reluctance to see male physicians for health information. The women reported feelings of discomfort and fear from male physicians examining them or their daughters, elaborating that they were concerned about being taken advantage of by a male physician, even in a clinical setting. While this was not a unanimous position, most women agreed that female gynecologists and/or providers were more appropriate for provision of health information to their daughters. As one woman expressed, “We’re afraid of male doctors, what if they are moved by their emotions/lust and do something while examining girls?” All women in the group, comprised of mostly Egyptian Muslims, agreed. The group, however, with English speakers who have been in the US longer had no mention of discomfort with male physicians examining or providing health information to their daughters. Most women reported that their daughters obtained health information from various sources including different media [television, magazines, books, newspapers, and Internet], school curricula, friends, and to a lesser extent, mothers and other family members.

Religion and Conceptualization of Disease

Religion was used as a framework for understanding a number of complex ideas regarding health, particularly among Muslim participants. Specifically, women (both Muslim and Christian) used religion as a vehicle for coping with (1) non-modifiable breast cancer risk factors, such as genetic predisposition and (2) poor prognoses and health outcomes. While most women seemed to desire to be active agents in their own health, they also expressed feeling that there are some things they cannot control. They unanimously cited fate and God's will as the ultimate cause of disease and/or cure, regardless of religious persuasion across all groups. As one woman explained, "We try not to live in constant fear, but we believe in fate and everything is ultimately part of God's will." Although the group with English speakers shared these beliefs, most of them did acknowledge that non-modifiable risk factors also contribute to the development of breast cancer.

Several women in one group composed of all Muslims, predominantly Egyptian, used Islam as a source of guidelines for behaviors including sex and smoking, often describing sexual relationships as sacred. One woman explained, "Having a sexual relationship between a man and a woman without marriage is forbidden. So we must be open with our children because when I got married I did not know anything. " Another woman added, "We must teach our children about health and let them know that God is always watching; we must teach them the principles of Islam." All of the women agreed.

Cancer Beliefs

Participants identified various factors that may cause cancer, but were not always in consensus. Disagreements regarding cancer beliefs in one group stemmed from different anecdotal experiences with cancer. For instance, one woman believed that accidents might be the cause of cancer because of her father's diagnosis after a car accident. Another woman cited that she was sure environmental factors were not relevant due to two cousins who had lived in radically different environments with different diets, yet both died of cancer. Across the groups many participants did not believe that genetic predisposition, being above 40, and hormone replacement therapy could increase the likelihood of developing breast cancer due to fatalist beliefs and that God's will is the ultimate cause of disease. Participants also cited emotional liability and stress as risk factors. Regarding screening most women endorsed regular breast self-exams, but seemed less certain of the benefits of receiving routine mammography. Some women reported that getting a mammogram once every 2 years was sufficient due to concerns about radiation they have heard through word of mouth, and others were unsure of the recommended age to begin screening. The group with English speakers that have been in the US longer demonstrated a better understanding of the benefits of routine mammography in comparison to other groups. One woman stated, "Mammograms can discover something abnormal in the body before it develops to a cancer." The other women nodded in agreement. The group that reported the least amount of education, however, knew little to nothing about screening guidelines and the benefits of mammograms.

Discussion

The Arab American population is increasing and diversifying [4]. This qualitative study reveals important insights into the breast cancer-related information dissemination across generations of Arab American mothers in NYC. Generational differences between health knowledge differences reported by the participating women vis-a-vis their daughters were apparent in all focus groups.

There were maternal perceptions of stark differences between health information access across generations. The younger generations have the privilege of access to numerous sources of health education due to their increased acculturation, fluency in English, increased health education available in schools, and higher computer/Internet literacy. Given that mothers reported having limited sources of health information and seemed reluctant to obtain information from friends or healthcare providers, materials in Arabic need to be made available. Providing similar health information to young women may facilitate a bi-directional exchange of health knowledge between generations.

The question of making materials in Arabic available to mothers is complicated by the fact of varying levels of education and literacy among Arab immigrants from different countries of origin and educational backgrounds, however it is necessary [3]. One focus group showed a greater knowledge of breast cancer and the benefits of screenings, which may have been due to their increased levels of English proficiency and younger ages at time of immigration, while the group with the least amount of education had little knowledge of these topics. Breast health education that is responsive to different social determinants (education levels, varied levels of acculturation and English proficiency) is necessary when targeting Arab-American women. For instance, due to documented low education levels amongst Yemini women, perhaps developing oral education may be a better method to reach this population. The heavy stigmatization placed on disease, namely cancer and sexual/reproductive health should be taken into account when disseminating information. Additionally, much has been made about the influence of religion with this population, however, results showed that culture may play a larger role as Christian and Muslim women shared similar opinions. Muslim women, however, did use Islam as a context for their comments. Although non-religious based strategies for education for Arab Americans have proven successful [10], using Islam as a framework for providing health information may prove an innovative strategy for Muslim women.

Community and faith based organizations are a critical tool for providing breast cancer education and awareness. Partnering with these organizations is important to developing trust within Arab American communities, providing a platform for disseminating information i.e. the AMBER model [11]. Some organizations do have a focus on healthcare access with health insurance enrollers on staff and community health workers; therefore, they could serve as an important partner to increase access to breast cancer screening for this population. The AMBER program, based on this model throughout NYC, described in earlier papers, furthers formative research and therefore population-specific interventions are realized including education, screening coordination, and cultural competency trainings for healthcare providers [11].

There may be limitations to the generalizability of this data due to the small sample size and the groups being conducted as part of the AMBER initiative, because some women were familiar with focus group leaders. Generalizability could have been enhanced by conducting more focus group sessions and recruiting independently of the AMBER program.

Conclusion

This study addressed an important gap in today's immigrant health literature. By examining the breast cancer information seeking practices of Arab American women, with attention to differences between generations, the data gathered from this study provide meaningful insight into the importance of using a multipronged approach to disseminate information including the use of multi-media sources, written and oral materials, and partnerships with community and faith based organizations, promoting bi-directional exchanges between the generations.

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Innovations in Telehealth – New Models for Improving Healthcare Across Borders

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Abstract/Summary

Telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve a patient's health status. Telemedicine and telehealth solutions are now being incorporated into the mainstream delivery of medical, educational, and administrative services around the globe. The Arizona Telemedicine Program (ATP) has been providing telehealth services since 1997, with over 10,000 specialty consultations and over 1.3 million teleradiology consults provided to date. ATP has also engaged in providing as well as helping establish telemedicine programs in other countries. Starting and sustaining a telemedicine program has its challenges. This paper will provide an overview of the ATP telemedicine experience, its international outreach efforts, and useful ways to implement and sustain a telemedicine program.

What Is Telemedicine?

According to the American Telemedicine Association[1] "telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health status." The ways in which this information can be exchanged are numerous and cover both real-time interactive, store-and-forward, and hybrid models using 2-way live interactive videoconferencing, email, smart phones, wireless tools and a host of other mechanisms. Telemedicine *is not* a separate clinical specialty. Sometimes the term telehealth is used which is a broader term for remote healthcare but does not always involve clinical services. It is closely allied with HIT (Health Information Technology), but HIT deals more commonly with electronic health records and related information systems. There is no limit to the places telemedicine can be conducted in and practices range from large hospitals to small clinics, schools, workplaces, prisons, the military, patient homes, hospice, nursing homes and other care and living facilities. Telemedicine originally started out with the goal of getting specialty and other healthcare services to patients in rural areas, but has expanded incredibly since the early days to cover rural, urban, suburban, cruise ships, and other remote work locations such as off-shore oil rigs and outer space.[2-7]

The Arizona Telemedicine Program

In 1996 the Arizona Telemedicine Program (ATP) was created by the Arizona State Legislature as a multidisciplinary, university-based program.[8] Its mission is to provide telemedicine services, distance learning, informatics training, and telemedicine technology assessment within the state of Arizona. The program is mandated to provide telemedicine services to a range of healthcare users including communities that are geographically isolated, Indian tribes, and the Department of Corrections (prisons). The telecommunications infrastructure was built by the ATP, and services were initially implemented in 1997 with eight pilot sites. Today ATP operates a broadband telecommunications network linking over 150 healthcare organizations (not-for-profit and profit). It functions as a "virtual corporation". To date over consultations have taken place over this private ATM telemedicine network. The network operates on T-1 and T-3 circuits leased from commercial vendors. Consultations have been carried out using store-and-forward and real-time technologies in over 55 clinical sub-specialties. Teleradiology[9] services account for the majority of consultations, and the key real-time specialties are telepsychiatry, telerheumatology and teleinfectious disease. We also provide continuing education as well as patient education using the network.[10]

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Common Models of International Telemedicine

International telemedicine (providing services from one country to another) is becoming increasingly popular and useful in terms of addressing healthcare needs around the world.[11-14] There is no one-size-fits-all model, but there are some common approaches that have been used successfully depending on the circumstances and levels of commitment. A common model is the non-profit in which hospitals in developed countries partner with organizations in developing countries to expand healthcare services in disadvantaged regions. In a for-profit model, the customers are often in nations with areas of concentrated wealth but lack capabilities in the broader medical market. Concierge services tailor almost exclusively to rich customers who cannot obtain the level of services at home that they would if they traveled abroad. A popular model in radiology, pathology and transcription is the reverse model, in which hospitals in more developed countries purchase services from (typically) clinicians Board-certified in the country receiving services at a lower price than could otherwise be purchased. These are typically referred to as "nighthawk" services and a number of radiology departments have used them to cover off-hours shifts.

Finally there is the service provider model, which is becoming increasingly popular and a major force in the telemedicine arena. Private companies are going beyond simply providing equipment or telecommunications and providing the actual clinical consultation services.[15] They hire the clinicians, take care of the legal and administrative aspects (e.g., licensing, credentialing, malpractice, billing), set up the telemedicine infrastructure at the receiving site, and then provide the services. There are variations on the model, and some companies provide some but not all of the services noted, but the key thing is that they provide the clinical services – often directly to patients. In fact, the American Telemedicine Association has recognized the growing influence of these direct-to-consumer service companies and developed an Accreditation program that "promotes patient safety, transparency of operations and adherence to all relevant laws and regulations…(providing) a benchmark to assure patients, payers and consumers that the organization's online patient consultative services meets the standards and guidance established for the program."[16]

Scope of Telemedicine

The actual extent of the use of telemedicine is hard to gauge precisely, but the global market is quite large now and growing exponentially. It is conservatively estimated that in the United States there are over 200 telemedicine networks, over 3500 telemedicine service sites, and over 50% of hospitals are engaged in some sort of telemedicine.[17] Globally in terms of World Health Organization (WHO) member states, some countries have formal policies with respect to telemedicine practice while others practice more informally, but over half have some sort of telemedicine. The most common services are radiology and pathology, followed by cardiology, surgery, ophthalmology, nephrology, ob/gyn, dermatology, and infectious disease.[17]

By 2016 the global telemedicine market is expected to be over $27 billion, with the telehospital/clinic segment over $8 billion, the telehome market over $3.5 billion, the technology market nearly $5 billion, and the service market close to $16 billion.[17] The expected result in a significant reduction in healthcare costs, improvement in healthcare outcomes, and improved quality of life around the globe. Clearly telemedicine is having a huge impact on patient care throughout the world in many ways and it will continue to grow in influence and hopefully outcomes.

A Successful International Telemedicine – The Swinfen Charitable Trust

There are of course a number of successful international outreach programs that show how effectively telemedicine can be done across borders, but one of the best examples of an existing program that has had long-term success is the Swinfen Charitable Trust.[18-21] This program was started in 1998 by Lord and Lady Swinfen to facilitate the provision of low-cost telemedicine services, linking healthcare providers in the developing world with healthcare providers in developed countries. It is a store-and-forward model in which healthcare providers send photos, clinical history and other patient information via a secure web-based messaging system to the Trust. The Trust triages the requests to the appropriate clinician(s) that have volunteered to provide consultations (free of charge) and they then provide a response back to the question initiator. The majority of the consultants are in the US, UK, Australia, Canada and New Zealand and the referrals have come from all over the world. The median time for a reply to a request is 1.5 days and the service is covered 24/7. A survey was conducted at one point concerning the value of the consultation to the referring doctor, and half said that it improved their management of the case.[21]

Since 2001 the Trust has been providing services to the Middle East.[22] From July 2004 to June 2007 they had 283 referrals from four countries - Iraq, Afghanistan, Pakistan, and Kuwait, with 500 cases from 22 other countries. The 283 cases were associated with 522 separate specialist referral questions, with a median time to reply of 24.3 hours. The Middle East cases compared to the rest of the world had significantly more obstetric cases and fewer in other specialties and radiology. Overall both referring and consulting healthcare providers were satisfied with the service. Email teleconsultations are a very effective way to provide international healthcare support and improve patient care.

Arizona Telemedicine Program International Outreach

One of the first international outreach programs the ATP was involved with was telepathology services to China.[23] The program was validated with a study that documented the diagnostic accuracy of static-image telepathology in the setting of a surgical pathology consultation practice. 171 telepathology consultation cases were analyzed that had been submitted to the ATP by pathologists from 6 institutions in Arizona, Mexico, and China. The telepathologists could provide a diagnosis or defer ask for additional video images, glass slides, or to tissue blocks for special studies such as immunohistochemistry. 144 cases were diagnosed and 27 deferred. There was 88.2% concordance by two telepathologists reading the digital vs glass slide images, with 96.5% concordance for clinically important diagnoses. This was one of the very early international telepathology projects.

Another important program was developed by Rifat Latifi, MD that created a model for establishing sustainable international telemedicine programs.[24] The program encompasses telemedicine and e-learning and its first initiative was in Kosova where the healthcare infrastructure had been decimated by a variety of factors including wars, neglect, and lack of funding. Latifi created the International Virtual e-Hospital (IVeH) which has a comprehensive, four-pronged strategy called “Initiate–Build–Operate–Transfer” (IBOT). IBOT helps to establish and develop telemedicine programs by assessing healthcare needs of a country, developing a curriculum and education program, establishing a telemedicine network, and integrating it into the healthcare infrastructure. The goal is to transfer a sustainable telehealth program to the nation. It was successfully implemented in Kosova, Albania, Macedonia, and other countries around the world.

Another very successful international effort was the ATP-US Army-Republic of Panama Initiative.[25] The effort started in 2000 when the US Army Yuma Proving Ground created a program to help Panama establish a rural telemedicine program. The ATP was asked to participate given its extensive experience in telemedicine. The first step was to get buy-in by the Panamanian Ministry of Health and academic leaders of the national universities. The result was a telemedicine demonstration project that consisted of a single hub site and three rural community health centers. The program was set up to use real-time bidirectional videoconferencing using videophones connected by Internet protocol networks at 768 kps. The services provided were pediatrics, obstetrics, pulmonology, dermatology, and emergency care. The US turned the program over completely to the Panamanians in September 2009 and the 3 sites remain in operation with over 5000 cases completed. The Panamanian Telemedicine and Telehealth Program (PTTP) became self-sufficient and serves as a model of what can be achieved with international cooperation.

Successful Strategies

There are lots of challenges in international telemedicine. There are often non-governmental organizations (and government run ones) that enter countries with the goal of providing help, but do little to coordinate their efforts with other programs or with existing infrastructure. They are often duplicative, end up being short-lived as they are often funded as a demonstration project with not long-term plans for sustainability, and thus often are not trusted and hence not used by the local populations they are trying to help. Telemedicine programs need to do more than swoop in, set up practice and try to provide services in ways they are familiar with. They need to include training, education, develop ways to transfer the locus of control and operations to the local healthcare system, adapt to local circumstances, environment, culture and population, and develop and foster cultural sensitivity.

There are many opportunities to expand telehealth around the world and benefit patients. The International Society for Telemedicine and eHealth (ISfTeH) has even proposed a framework to help guide the infrastructure for such developments.[13] It proposes that there should be a national e-health council composed of relevant stakeholders to provide policy advice to the government; an e-health corps composed of e-health workers to supplement and facilitate the work of other health care professionals (e.g., clinicians, nurses); e-health steering committees to advise health authorities on setting policy and helping establish strategic directions; networks or centers of e-health excellence to provide coordination, support, education, policy advice etc.; and e-health professional societies for exchange of ideas and knowledge.

Whether the above model is used or any of the other models or programs discussed above is used, there are lots of opportunities to build telemedicine programs in the Arab world. More importantly there are already a number of successful outreach programs that have been established that are already providing the means, education and training to support telehealth in the Arab world.[26-31]

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Effectiveness of Patient Education on Rheumatoid Arthritis Patients in Salalah.

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Abstract

Introduction

Rheumatoid arthritis (RA) is a common inflammatory disease with a prevalence varying from 0.7-3% and an average 1% in adult population world-wide, and 0.85% in Oman.

Purpose

Purpose was to find the effectiveness of patient education on self - efficacy, fatigue and optimal physical functional status of Omani RA patients in Salalah. The objectives of the study were to assess the severity of Rheumatoid arthritis related fatigue (RAF), nature of perceived self-efficacy (PSE), and physical functional status (PFS) of RA patients, find the effectiveness of health education on perceived self-efficacy, fatigue, and physical functional status; find the relation between perceived self-efficacy and fatigue, perceived self- efficacy and physical functional status, and, fatigue and physical functional status of RA patients; find the relation between the variables.

Methods

A one group pretest posttest design was used. Data were collected from a purposive sample of 76 RA patients, using Arabic version of Arthritis self-efficacy scale (ASES), multidimensional assessment of fatigue scale (MAF), and health assessment questionnaire (HAQ) before and after the intervention. Patients were individually taught about Rheumatoid arthritis. Leaflet on Rheumatoid arthritis was given to the patients. Family members were also included in the health education session.

Results

Out of the 76 patients 90.8% were females and were married (82.90%) and 29% of the sample were between the age group o 40-49 yrs. 82.90% reported no family history of RA and 42.10% were known to have RA for the past 3-6 yrs, and 39.5% for more than 6 yrs. Co-morbid conditions were found in 44.70% of the sample. The mean posttest score of self-efficacy was 7.25±1.46, compared to the mean pretest (4.79±1.59) score. There was a reduction in the mean posttest scores of MAF (21.15±6.47) and HAQ (0.49±0.46) than the mean pretest scores 31.88±9.45; 1.20±0.74 respectively. Wilcoxon-matched pair signed-rank test showed that education was effective to increase self-efficacy (Z= -7.48; p<0.001) and decrease fatigue (Z= -7.35; p<0.001); physical disability (Z= -7.37; p<0.001). The study reports are similar to the results of many of the previous studies.

Conclusions

Educating on RA helps patients to get accustomed to living with it. It has many implications in the disciplines of nursing practice, education, administration and research.

Introduction

Rheumatoid Arthritis (RA) is an autoimmune disorder of unknown etiology which mainly affects the synovial membranes of multiple joints and may also affect other systems in the body. Because of the unknown etiology of RA, it has been described as "one of the modern medicine's major enigmas."[1] The onset of RA is a "life-changing event", implying the start of a lifelong process of "adaptation to significant physical, psychological, social and environmental changes'. RA impact on various levels of a person's functioning. The symptoms vary from pain, stiffness and fatigue to malaise. Besides the obvious physical symptoms, psychological and social domains are adversely affected.

Fatigue is a common problem in RA, experienced by the majority of patients, with fatigue scores that are often higher than pain scores. Fatigue can be very significant when it contributes to work disability, personal injury, inability to participate in a rehabilitation program and strained relationships. Studies have found that the prevalence of fatigue in adults with RA is 80-93%,[2] despite this, patient's fatigue has been largely ignored by clinicians[3] and only a few evidence-based interventions are available.

RA is a common inflammatory disease in developed countries. Based on the early studies conducted in the Arab world, there exists a belief that RA is less common and milder in this region than in the developed world. But the prevalence and severity of symptoms of RA are reported to be in the same range as in developing countries. The prevalence of RA varies from country to country, from 0.7% to 3%, with an average of 1% in adult population worldwide. In the Gulf region, two studies estimated the prevalence of RA to be 1% in the Iraqi population[4], 0.85 in the Omani population,[5] and 2.2 per thousand people in Al Qassim region of Saudi Arabia. Two- thirds of all RA patients are women[6]. The prevalence and incidence of RA increase from the age of 70 onwards.

Improved management of RA is very vital for the benefit of both patients and health economics. Adequate self- management is extremely important as it is a chronic and disabling disease. Self-efficacy beliefs have an important role as they affect RA patient functioning.[7] Patient education as a part of the routine management of RA is helpful to increase patients' self-efficacy. It can help patients make informed decisions about adjustment in their treatment regimen and in attaining the necessary self- management skills for dealing with the consequences of their disease. Very few researches have been conducted in Oman related to effect of patient education on RA. Hence the researcher felt the need for this study.

Objectives

The purpose of the study was to find the effect of patient education on RA patients. The objectives of the study are to a) determine the severity of RA related fatigue (RAF); b) identify the nature of perceived self- efficacy (PSE); c) assess the physical functional status (PFS); d) find the effectiveness of patient education on- perceived self- efficacy, fatigue and physical functional status of Rheumatoid arthritis patients; e) find the relation between the study variables.

Methodology

Design and sample

An evaluative, one group pre-test, post-test quasi experimental design was used for this study. The sample consisted of 76 patients attending the Rheumatology polyclinic of Sultan Qaboos Hospital (SQH), Salalah, Oman. Arabic speaking patients with RA between the ages of 20- 75 years without any hearing impairment were selected purposively. The sample size was large enough to give a statistically significant result at 0.05 levels as per the Slovin's formula.

Conceptual framework

According to the health belief model, modifying variables, cues to action and self- efficacy affect our perception of susceptibility, seriousness, benefits, and barriers, and therefore, our behavior (Figure.1).

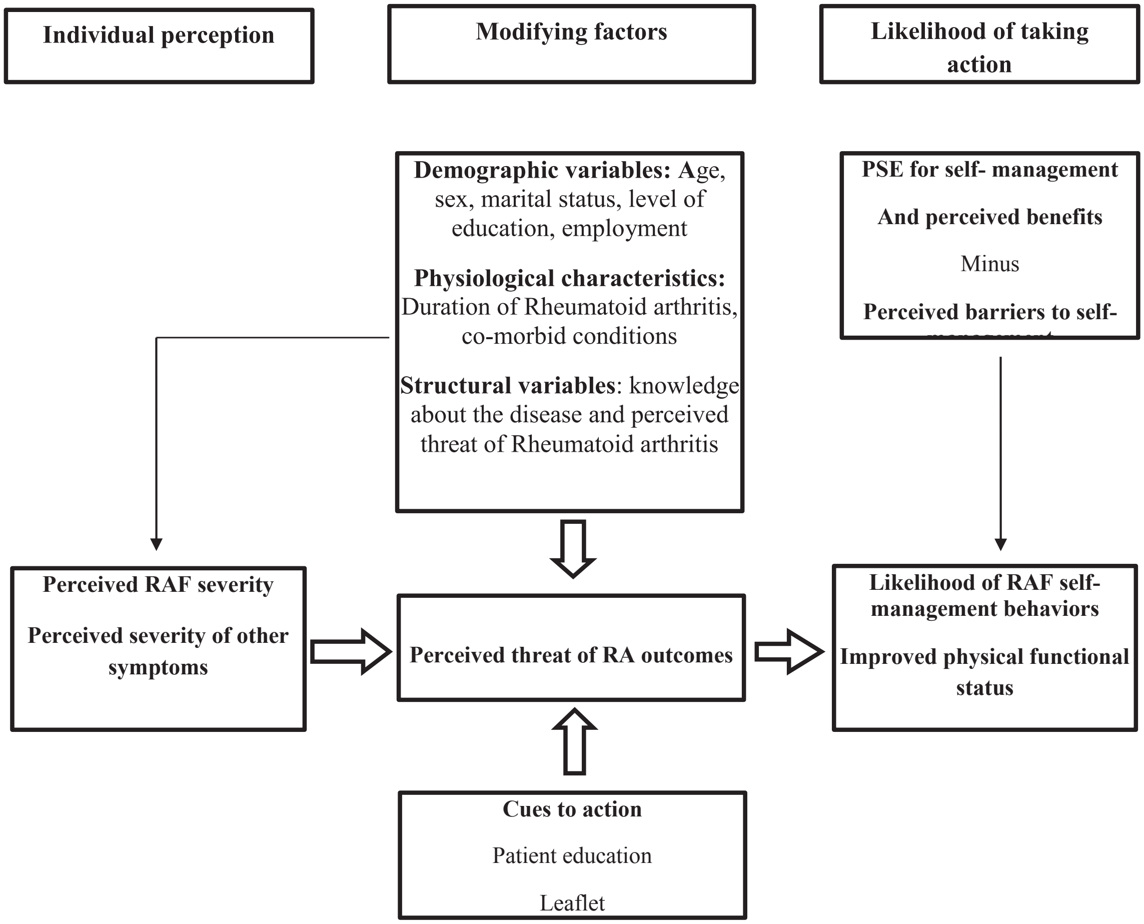


Figure 1: Conceptual framework of the study based on Stretecher &Rosenstock's Health Belief Model (1997)

Rheumatoid arthritis related fatigue severity and the severity of other symptoms (individual perception) can be affected by modifying factors like demographic variables, duration of the disease, level of education, employment and knowledge about the disease. This, in turn, can affect the perceived threat of RA outcomes. Perceived barriers to self- management can be overcome by increasing self- efficacy through patient education (cues to action), thereby, self- management behaviors can be promoted. This can improve the physical functional status of the patient. Thus the health belief model and self- efficacy theory suggest that the most influential factors for changing health behaviors are: perceived threat (influenced by perceived severity and susceptibility to the disease, and cues to action, (such as increased disease symptoms and advise from others); perceived barriers to using health behaviors; and self- efficacy. Perceived benefits and belief in ability must outweigh perceived barriers, for change to result.

Ethical considerations

Permission to conduct the study was obtained from the Director of SQH, Salalah. The researcher explained the study to the potential participants. Written informed consent was obtained from every patient and anonymity and confidentiality were assured. The staff and clinicians of the Rheumatology clinic were informed about the purpose and plan of the study to obtain their cooperation. Permission to use the standardized tools was obtained from the authors through electronic mail. A pilot study was conducted in the Rheumatology polyclinic of Sultan Qaboos Hospital, Salalah prior to the main study.

Data collection

Data was collected using demographic proforma, arthritis self -efficacy scale (ASES), Multidimensional assessment of fatigue scale (MAF), and Health assessment questionnaire (HAQ). Tools were assessed for its appropriateness for the study by sending it to experts. The tools were translated into Arabic and sent to language experts, translated back into English to verify for any change in the meaning, pretested with five patients; were found suitable for the study.

Demographic proforma

Demographic proforma including gender, age, marital status, educational level, employment status, disease duration, family history and co-morbid conditions were collectedThis enabled the researcher to understand the samples better.

Arthritis self- efficacy scale

Patient self-efficacy was estimated using the standardized tool Arthritis self- efficacy scale (ASES) developed by Lorig et al in 1989.[8] The ASES has 20 items divided into three subscales: pain self- efficacy (SE pain, five items), function self- efficacy (SE function, nine items) and other symptom self-efficacy (SE other symptoms, six items). Each item is scored on a 10 mm scale, where one is very uncertain and ten is very certain. The subscales of the ASES were summarized and subdivided into four subscales for further analysis: 1) very uncertain (0-2.5), 2) quite uncertain (2.6-5), 3) quite certain (5.1-7.5), and 4) very certain (7.6-10). The patients are required to indicate how certain they are of performing specific tasks with regard to pain, function and other symptoms. ASES is the dominant measure of self-efficacy in arthritis and has been in use worldwide since 1990. It was found to be reliable and valid. Internal consistency of SE pain, SE function and SE other symptoms were 0.75. 0.90 and 0.87 respectively and test retest reliability were 0.87, 0.85 and 0.90 respectively. It has reported face and content validity

Multidimensional assessment of fatigue scale

The multidimensional assessment of fatigue[9] (MAF) scale contains 16 items and measures four dimensions of fatigue: severity, distress, degree of interference in activities of daily living and timing. Fourteen items contain numerical rating scales and two items have multiple choice responses. Respondents were asked to reflect on fatigue patterns in the past week. It was selected because it is a good choice, easy to administer and score, relatively short in length, and assesses the subjective aspects of fatigue including quantity, degree, distress, impact and timing, and also it is Rheumatoid arthritis specific. The questionnaire also allows patients to omit activity items that do not apply, thus making it a more accurate assessment of the impact of fatigue on activities of daily living. It has reported face and content validity. Reliability was reflected by good internal consistency -interim correlations of 0.53-0.83, Cronbach's alpha 0.93.

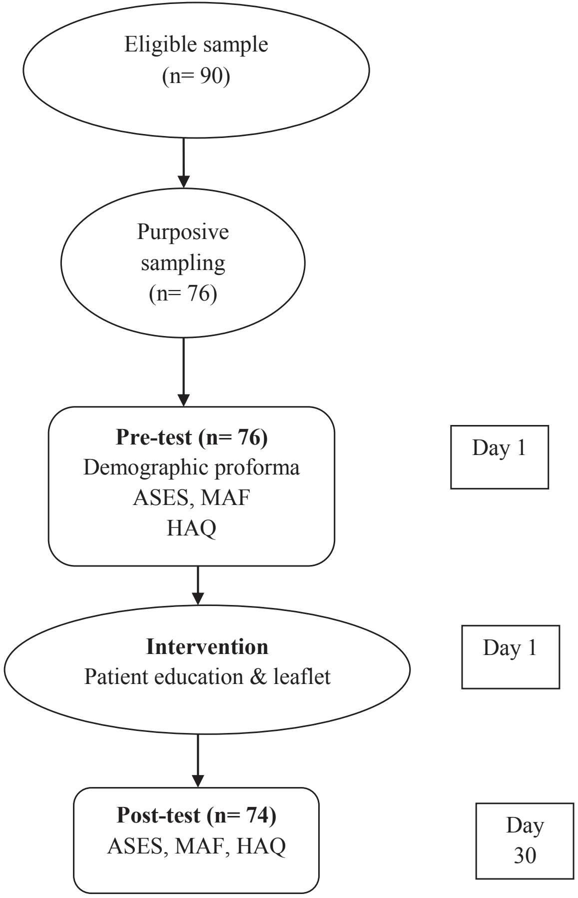
Question 1-15 form the final score (global fatigue index, 0-50) whereas question 16 is concerned with the change over the past week. To calculate the global fatigue index: First, the item number 15 was converted to a 0-10 scale by multiplying each score by 2.5. The final score consists of the total items 1-3, the average of items 4-14 and the converted score of item 15. The score ranges from 1 (no fatigue) to 50 (severe fatigue).

Health assessment questionnaire

The patient's physical functional status was measured using the Health Assessment Questionnaire (HAQ).[10] The HAQ contains 20 statements under eight subscales covering activities of daily living: dressing and grooming, walking, hygiene, getting up and eating, grip, reach and activities, that are measured on the scale from zero to three: zero indicates that the respondent could perform a certain activity without any difficulty during the previous week, one indicates that the respondent had slight difficulty, two indicates great difficulties and three indicates that the respondent could not perform the activity at all. The score of each category is the single response within the category with the highest score. The score for the disability index is the mean of the eight category scores. The higher score indicates greater disability. The HAQ disability scale is sensitive to change and is a good predictor of future disability. Test re-tests correlations range from 0.87 to 0.99. It has reported face and content validity.

On the first day pre-test was done using the tools. Patient education on RA and leaflet were given on the same day. Post-test was done on the 30th day. The following figure illustrates the data collection procedure.

Figure 2: Data collection procedure



Results

Data was analyzed using both descriptive and analytical statistics with the help of SPSS for windows version 11. Descriptive statistics were used to summarize the demographic variables and the study variables. Wilcoxon- matched pairs -signed rank test was used to evaluate the pre-test and post-test scores. Pearson's correlation was used to evaluate the relationship between the study variables.

Sample Characteristics

The demographic characteristics of the sample are shown in table 1. The study included 76 RA patients. Majority of the sample (90.8%) were females, 29% of the sample was between the age group of 40-49yrs. Forty one percentage of the sample was illiterate and 42.10% was known to have RA for the past 3-6 years.

Table 1: Frequency and percentage distribution of sample according to socio-demographic variables n=76

Sample characteristics	f	%
Age in yrs		
20-29	9	11.80
30-39	18	23.70
40-49	22	28.90
50-59	15	19.70
60-69	8	10.50
70-79	4	05.30
Gender		
Male	7	09.20
Female	69	90.80
Marital status		
Single	13	17.10
Married	63	82.90
Educational level		
Illiterate	31	40.8
Primary school	37	48.7
College	7	9.2
Professional	1	1.3
Family history of RA		
Yes	13	17.10
No	63	82.90
Duration of RA		
< 1 yr	8	10.50
1-3 yrs	6	07.90
3-6yrs	32	42.10
>6 yrs	30	39.50

Arthritis Self efficacy

The baseline score of RA patients on ASE scale, shows that a majority of the sample (54.1%) was quite uncertain about their efficacy (total score) regarding various aspects of RA management (subscales: pain self-efficacy 71.6%, function self-efficacy 50%, and efficacy on other symptoms 56.8%). Majority was uncertain about managing pain without interfering daily activities (71.1%) and sleep (69.7%). Regarding small to moderate or large reduction of pain without taking extra medications, majority was uncertain (78.9% or 81.6% respectively).

Arthritis self-efficacy function sub scale assessed the self-efficacy of RA patients for their day to day activity management. Response showed that they were uncertain about their self-efficacy to do activities like walking 100 feet on flat ground for 20 minutes (61.8%), walking 10 steps downstairs in 7 seconds (77.6%), getting out of armless chair quickly without support (67.1%), and turning the outdoor faucet on and off (73.7%).

On the third subscale of ASEC (self-efficacy other symptoms) the majority scored uncertain about their efficacy in controlling fatigue (71.1%), regulating activity without aggravating arthritis (61.8%), managing arthritis symptoms (68.4%) and pain (75%), helping self in feeling better (73.7%) and dealing with the frustration of arthritis(64.5%).

Analysis presented in table 2 shows that 54.1% of the sample were quite uncertain about their efficacy based on the pre-test ASES score and 54.1% of the sample were quite certain about their efficacy based on the post-test ASES score, which shows the improvement in self-efficacy. Patients were quite uncertain about their efficacy in making a large reduction of the pain (mean 4.16)

Table 2: Frequency, percentage, mean and standard deviation of pre-test and post-test scores of arthritis self -efficacy scale (ASES) n= 74

Subscales	**Pre-test**				**Post-test**			
	f	**%**	**Mean**	**SD**	**f**	**%**	**Mean**	**SD**
Pain self -efficacy			**4.60**	**1.71**			**7.23**	**1.64**
Very uncertain	5	6.8			0	0		
Quite uncertain	53	71.6			4	5.4		
Quite certain	10	13.5			42	56.8		
Very certain	6	8.1			28	37.8		
Function self- efficacy			**4.99**	**1.76**			**7.32**	**1.50**
Very uncertain	7	9.5			0	0		
Quite uncertain	37	50			4	5.4		
Quite certain	22	29.7			37	50		
Very certain	8	10.8			33	44.6		
Other symptoms			**4.81**	**2.00**			**7.33**	**1.66**
Very uncertain	6	8.1			0	0		
Quite uncertain	42	56.8			4	5.4		
Quite certain	17	23			36	48.6		
Very certain	9	12.2			34	45.9		
Total			**4.79**	**1.59**			**7.25**	**1.46**
Very uncertain	5	6.8			1	1.4		
Quite uncertain	40	54.1			1	1.4		
Quite certain	23	31.1			40	54.1		
Very certain	6	8.1			32	43.2		

Post-test score of ASES shows that there was an improvement in the self-efficacy of RA patients on all subscales. Wilcoxon matched- pairs signed- rank test between pre-test and post-test ASES score of the sample was done to establish the statistical significance of the improvement and the results are shown in table 3.

Table 3: Wilcoxon matched- pairs signed- rank test between pre-test and post-test ASES score of the sample **n= 74**

ASES Scores	Median	(Q1, Q3)	Z	P value
Pre-test	4.40	(3.90 , 5.65)	-7.19	0.0001*
Post-test	7	(6.07 , 8.69)		

* Significant

Table 3 describes that the post-test arthritis self-efficacy score (Mdn=7) was more than the pre-test arthritis self-efficacy score (Mdn= 4.40), *Z*= -7.19, p< .0001. The p value is less than 0.05 and it is inferred that patient education increases arthritis self-efficacy.

Fatigue in RA patients

The findings presented in table 4 indicate that the mean posttest score of MAF total was 21.15 with SD ±6.47 and the mean pretest score of MAF was 31.88 with SD ±9.45. For MAF tool- higher score indicates more fatigue and lower score indicates less fatigue. This data show that fatigue level decreased with the intervention.

Table 4: Mean and standard deviation of pretest and posttest scores of multidimensional assessment of fatigue scale (MAF) **n= 74**

MAF	Pretest		Posttest	
	Mean	SD	Mean	SD
Fatigue score	6.91	1.99	4.78	1.56
Severity	6.34	2.24	4.16	1.57
Fatigue while ADL	6.15	2.20	4.20	1.54
MAF total	31.88	9.45	21.15	6.47

Data given in table 5 describes that 39.2% of the sample had fatigue occasionally during pretest and 88.1% had occasional fatigue during posttest. Also, 62.2% of the sample had rated their fatigue as gone up and down based on the pretest scores. The posttest score showed that fatigue had stayed the same for the majority (73.1%).

Table 5: Frequency and percentage distribution of sample based on pretest and posttest of frequency and change in fatigue. **n= 74**

Fatigue	Pretest		posttest	
	f	%	f	%
Frequency of fatigue				
Hardly any days	2	2.70	1	1.40
occasionally	29	39.20	66	88.10
Most, but not on all days	27	36.50	7	9.50
Every day	16	21.60	0	0
Change in fatigue				
Decreased	6	8.10	4	5.40
Stayed the same	15	20.30	51	73.10
Gone up and down	46	62.20	19	25.70
Increased	7	9.50	0	0

Wilcoxon matched- pairs signed- rank test between pre-test and post-test MAF score of the sample was done to establish the statistical significance of the improvement and the results are shown in table 6.

Table 6: Wilcoxon matched- pairs signed- rank test between pretest and posttest MAF scores of the sample

n= 74

MAF Scores	**Median**	**(Q1, Q3)**	**Z**	**P value**
Pretest	31.10	(25.91 , 38.43)	-7.35	0.0001*
posttest	20.48	(16.09 , 24.61)		

* Significant

The findings in table 6 describes that there was a decrease in the posttest multidimensional assessment of fatigue scale (MAF) score (Mdn= 20.48) compared to the pretest MAF score (Mdn= 31.10), *Z* = -7.35, p< .0001.

Physical functional status based on HAQ

The physical functional status of the sample based on the health assessment questionnaire (HAQ) was analyzed. The HAQ scale has eight subscales namely, dressing and grooming, arising, eating, walking, hygiene, reach, grip and activities. The findings are presented in table 7 and 8.

The findings in table 7 show that 77% of the sample, based on the posttest score, reported that they can perform dressing and grooming without any difficulty. Among the sample 48.6% had some difficulty in walking and arising based on the pretest scores however, 52.7% and 63.5% can walk and arise without difficulty based on the posttest.

Table 7: Frequency, percentage, mean and standard deviation of pretest and posttest scores of sample based on HAQ subscales Dressing and grooming, arising, eating and walking

n= 74

subscales	**Pretest**				**Posttest**			
	f	**%**	**Mean**	**SD**	**f**	**%**	**Mean**	**SD**
Dressing & grooming			**0.82**	**0.83**			**0.28**	**0.59**
Without difficulty	29	39.2			57	77		
Some difficulty	33	44.60			14	18.9		
Much difficulty	8	10.80			2	2.70		
Unable	4	05.40			1	1.40		
Arising			**1.09**	**0.89**			**0.43**	**0.64**
Without difficulty	19	25.70			47	63.50		
Some difficulty	36	48.60			23	31.10		
Much difficulty	12	16.20			3	4.10		
Unable	7	9.50			1	1.40		
Eating			**1.14**	**1.02**			**0.43**	**0.55**
Without difficulty	23	31.10			44	59.50		
Some difficulty	29	39.20			28	37.80		
Much difficulty	11	14.90			2	2.70		
Unable	11	14.90			0	0		
Walking			**1.40**	**0.99**			**0.57**	**0.66**
Without difficulty	11	14.90			39	52.70		
Some difficulty	36	48.60			28	37.80		
Much difficulty	11	14.90			7	9.50		
Unable	16	21.60			0	0		

The findings presented in table 8 depicts that 50% and 56.8% of the sample had some difficulty in grip and reach respectively based on the pretest score however, 62.2% and 59.5% of the sample were able to perform their activities of , reach and grip without difficulty respectively. Majority (66.2%) had some difficulty in activities based on the posttest scores. Among the sample 51.4% had some difficulty with personal hygiene based on the pretest score however 60.8% of the sample, based on the posttest score, reported that they can perform activities of hygiene without any difficulty.

Table 8: Frequency, percentage, mean and standard deviation of pretest and posttest scores of sample based on HAQ subscales hygiene, reach, grip and activity

n= 74

subscales	Pretest				Posttest			
	f	%	Mean	SD	f	%	Mean	SD
Hygiene			**1.00**	**0.86**			**0.46**	**0.62**
Without difficulty	21	28.40			45	60.80		
Some difficulty	38	21.40			24	32.40		
Much difficulty	9	12.20			5	6.80		
Unable	6	8.10			0	0		
Reach			**1.20**	**0.87**			**0.41**	**0.60**
Without difficulty	13	17.60			46	62.20		
Some difficulty	42	56.80			26	35.10		
Much difficulty	10	13.50			1	1.40		
Unable	9	12.20			1	1.40		
Grip			**1.07**	**0.91**			**0.47**	**0.65**
Without difficulty	20	27			44	59.50		
Some difficulty	37	50			26	35.10		
Much difficulty	9	12.2			3	4.1		
Unable	8	10.8			1	1.4		
Activity			**1.07**	**0.91**			**0.81**	**0.59**
Without difficulty	2	2.7			20	27		
Some difficulty	27	36.50			49	66.20		
Much difficulty	28	37.80			4	5.40		
Unable	17	23			1	1.40		

Higher scores in HAQ indicated greater disability and lower scores lesser disability. The mean posttest score of HAQ was 0.49 ±0.46 compared to the pretest (mean 1.20 ±0.74); hence most of the sample had lesser difficulty during posttest. Wilcoxon matched- pairs signed- rank test between pretest and posttest PFS based on HAQ scores of the sample (Table 9) shows that physical functional status of the participants improved after the patient teaching (HAQ posttest score Mdn= 0.38, pretest score Mdn= 1), *Z*= -7.37, p< .0001. It is inferred that patient teaching improves the physical functional status.

Table 9: Wilcoxon matched- pairs signed- rank test between pretest and posttest PFS based on HAQ scores of the sample

n= 74

HAQ Scores	Median	(Q1, Q3)	Z	P value
Pretest	1	(0.75 , 1.56)	-7.37	0.0001*
posttest	0.38	(0.13, 0.75)		

* Significant

Pearson's correlation was used to evaluate the relationship between the study variables. Table 10 shows the findings.

Table 10: Pearson's correlations for perceived self- efficacy, fatigue and physical functional status

n= 74

Study variables	Arthritis self -efficacy	Fatigue
Arthritis self- efficacy	_	_
Fatigue	-0.25*(0.03)	_
Physical functional status	0.07(0.57)	0.68*(0.0001)

*Significant; Value given in the parenthesis is the p value

There was a significant negative correlation between ASES score and fatigue (r = -0.25, p = 0.03). It is inferred that increase in self- efficacy decreases fatigue score.

There was a significant positive correlation between the scores of MAF scale and HAQ (r =0 .68, p < 0.0001) indicating that reduction in fatigue decrease physical disability. Correlation was not established between self-efficacy and physical functional status. This could be due to the inclusion of patients more than 70 yrs of age, who had permanent disability.

Discussion

In this study, it is concluded that the baseline self- efficacy and physical functional status of RA patients are poor, and they suffer higher degrees of fatigue. Findings also support the role of health education in increasing self -efficacy of RA patients. It is evident that patients with high self- efficacy manage their fatigue well. Similar results were obtained in the following previous studies.

Study by Makelainen et al (2008)[11]demonstrated similar pattern of self-efficacy scores; the median of RA patient's self-efficacy was 36 mm (range 0-98, IQR 32), 21% of the sample were quite uncertain about their self-efficacy, the median FSE was 18mm (range 0-89, IQR 27), OSE 25 mm (range 0-100, IQR 30) where lower scores indicated good self-efficacy. Baseline self-efficacy was 5.30 (range 3.40-6.20) in a study by Hammond et al (1999).[12]

Self-efficacy of RA patients in a study by Makelainen (2009)[13] showed that RA patient's self-efficacy varies from weak to strong. The patients' uncertainty level increased when they had to reduce their arthritis pain using non-medical techniques. The median score of pain self-efficacy (PSE) was 35.5 (IQR- 16.7, 48.2), function self-efficacy 18.4 (IQR 7.7, 34.3) and other symptoms SE 24.7 (10.3, 40.3).

Study by Cho et al[14] showed that RA patients had a higher degree of fatigue (F=4.76, p=0.006) than the healthy people, and in the study by Minnock et al (2009)[15] the mean base line fatigue score was 6.7 ±2.1; and 46.1 ± 28.6, range 0-99mm in the study by Makelainen et al (2008)[11]

A study done by Cho et al[14] confirmed that RA patients has a lower degree of ADL than healthy persons (F=4.58, p=0.04, and the baseline mean (SD) Health Assessment Questionnaire–Disability Index score in the study by Khanna et al (2008)[16] was 0.84 ±0.75 and 1.37 in a study by Minnock et al 2008.[15] Another study by Makelainen et al (2008)[11] showed that the HAQ index ranged from 0-3 (Mean 0.7 ± 0.7). The average HAQ score was 0.9 ± 0.7 (Range 0-2.2) in the study by Werner et al 2006.[17] Baseline HAQ score was 1.25 (range 0.88-2.2) in the study by Hammond et al (1999).[12]

A study by Hakkinen et al (2005)[18] which explored the associations between individual sub dimensions of the health assessment questionnaire (HAQ) and clinical variables in 304 RA patients showed that mean (range) total HAQ score was 0.92 (0 to 2.88) and varied from 0.73 to 1.04 in the sub dimensions. Disability was lowest in the "walking" and highest in the "reach" sub dimension.

Rastmanesh et al (2010)[19] evaluated the functional disability of 872 RA patients who visited the Sina Teaching hospital out-patient clinic and Rheumatology research centre out -patient clinic, Tehran, Iran using the Persian version of the HAQ. Four hundred and forty three patients reported much difficulty with getting on and off of toilet. The mean HAQ disability index was 0.89 ± 0.84, for arising 0.81 ±0.82, eating 0.91 ±0.95, hygiene 0.99 ± 1, for reach and activities 0.94 ±0.97, grip 0.82 and dressing 0.73.

Study by Lorig et al (2001)[20] showed an improvement in self-efficacy (p =0.05) of RA patients after the education program. In another study by Sohng (2003)[21] there was a significant improvement in self-efficacy (p=0.001) and fatigue (p=0.049) after the self-management course; and six months after the education program HAQ improved (p=0.003) significantly in the experimental group and a significant difference was found between the HAQ score of experimental and control group (p= 0.024) according to the study by Nunez et al (2006).[22]

Barlow and Wright (1998)[23] determined the effectiveness of self-management training among people with RA and OA (n=117) delivered in community settings of United Kingdom using questionnaires (ASES). Participant demonstrated significant increase in arthritis self- efficacy (p< 0.0005) and a significant decrease in fatigue (p < 0.002).

Taal et al (1993)[24] conducted a study among 57 RA patients to determine the effect of group self-management education program using experimental design with control group and pre and posttest (after 6 weeks, 4 months and 14 months). Greater improvements in the experimental group compared to the control group were demonstrated at 6 weeks and at 14 months in self-efficacy (p< 0.05). It also improved the health status and quality of life.

Another study confirms (Unsal A and Kasicki, 2010)[25] that self-efficacy levels after education were significantly improved in the experimental group (26.97 ± 10.50) compared to the control group (16.75 ± 9.54) (p= 0.0001). Similar results were obtained in the study conducted by Chui et al[26] in Hong Kong that the participants showed significant improvements in arthritis self- efficacy after the education and at one month follow up (p=0.003, p=0.001).

Study by Riemsma[27] et al showed similar results that fatigue correlated with physical function (r=0.38, p <0.001), and self-efficacy (r= -0.47, p<0.001). Study by Makelainen et al (2008)[11]demonstrated a strong linear correlation between ASE and HAQ (r= 0.8, p< 0.0001). Study by Mancuso et al (2006)[28] confirmed that higher fatigue after one year by having a greater physical functional disability among people with RA (p< 0.001).

Conclusion

There is an urgent requirement to address the important yet unmet need of patient education and develop properly designed and evaluated educational interventions, which will specifically address the complex lifestyle and pharmacological measures, required optimizing the general health of every person with RA. Prepared educational programs, aims of which are disease management, help patients get accustomed to living with the disease. RA patients can be supported in their fight against the chronic disease. The implications made in this study are vital to all health team members especially nursing education, practice, administration and research.

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Undergraduate Oncology Education: mini-literature review with single institution experience from Iraq

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KEYWORDS: *Undergraduate Oncology Curriculum, Medical Education, Iraq.*

Abstract

Background

Under-Graduate Medical Education (UGME) is the training vehicle for training physicians. As cancer incidence is increasing, it is important that medical students are introduced to the subject early in their medical studies. There is no agreed on global Under-Graduate Oncology Education (UGOE) syllabus.

Objectives

Mini-literature review of the UGOE with the description of the initiative accomplished in May 2014 at Tikrit University – College of Medicine, Iraq.

Methods

A literature search at the www.PubMed.gov using the search words {(oncology) AND "Education, Medical, Undergraduate"[Mesh]} was carried out. A description of the UGOE initiative done at Tikrit University, College of Medicine is also provided. Independent two samples t-test and two samples z-test were used for statistical analysis.

Results

UGOE as a distinct entity in medical education has attracted attention of medical educators over the past fifty years. There is an increasing emphasis on teaching and assessing values, attitudes, and beliefs associated with oncology care. From our experience, pre-course survey showed 54% of students state 6-9/annum oncology hours are not sufficient. Post-course survey indicated 51% a requirement for oncology 8-25/annum. This is compared to a proposed 12-70 in pre-course (p 0.001). 84% of responders chose that setting oncology standards is useful and 49% opted for voluntary summer oncology course. Topics that should be included as core competencies in UGOE syllabus are: diagnosis and treatment of cancer, basics of oncology and public health, general knowledge of common malignancies and complications, prognosis, and communication in oncology.

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Conclusions

Several publications, using surveys, attempted to investigate the status of UGOE and measure knowledge levels of medical students in cancer medicine. Most results demonstrated that appropriate integration of oncology is limited in many medical schools. The target of UGOE should not only be the provision of current oncological knowledge, but also the development of a comprehensive approach to cancer-related issues. There is a pressing need to intervene, in multiple ways, to improve oncology teaching. This is especially important for developing countries, where the burden of cancer is increasing. Our preliminary findings highlight a trend that the current UGOE requires further improvement. Literature that guides fulfilling such a need is available and can be readily used.

Introduction

Oncology is a branch of medicine, concerned with the study, diagnosis, treatment, and prevention of cancer [1]. Cancer is increasingly becoming one of the leading causes of mortality worldwide as the population ages [2]. Many educators have drawn attention to the need for oncology curriculum at the under- and post-graduate levels [3]. Trained properly, the doctors of tomorrow will be in a better position to understand and subsequently better manage the cancer patients [4].

Under-Graduate Medical Education (UGME) is the most important step to create the good physicians everywhere and it is important that all medical students learn about cancer as all qualified doctors encounter patients with cancer every now and then. However, there is no universal consensus on what should be learned at the Under-Graduate Oncology Education (UGOE) level, or what the best and most appropriate teaching methods are [5]. Moreover, UGOE, sometime, is poorly structured at universities and even absent in substantial number of institutions [6,7]. In spite of this general inappropriateness, there were good initiatives in this field, among which, the well-structured Australian [3,8-17] experience, in addition to many studies from North America (United States of America [18-27] and Canada [28-33]) and Europe (United Kingdom [5,34-38], France [39,40], Scandinavia [41], Poland [42] and other European nations [6,43-45]), this is beside some studies from other countries (Argentina [46], Turkey [47], Malaysia [48], India [49,50], Greece [51], Brazil [52], Egypt [53-55], Taiwan [56] and Lebanon [57]).

Iraq faced many challenges over the last three and half decades and continues to do so. UGOE, as many aspects of education in this country have been affected and currently in need of improvement [58,59]. The purpose of this work is to describe some of the published literature of UGOE globally, in addition to the description of the local initiative of UGOE at a single institution in Iraq.

Methods

A literature search performed in January 2015 for indexed papers at www.PubMed.gov using the search the terms {(oncology) AND “Education, Medical, Undergraduate”[Mesh]}. 204 results appeared, among which, 133 where selected for the mini-review. Sixty papers are reviewed due to their immediate relevance. An overview of the UGOE initiative at the University of Tikrit – College of Medicine is provided. Independent two samples t-test and two samples z-test were used for statistical analysis.

Results

Mini-literature review

UGOE as a component of the UGME is attracting more attention over the past five decades. Medical education has evolved from being a teacher-centered process to a learner-centered process focusing on problem-based learning and self-directed learning. Medical training is now recognized as a life-long process, encouraging students to become reflective practitioners with increasing emphasis on teaching and assessing values, attitudes, and beliefs in clinical care [5,12].

Four decades ago, the department of oncology at The Middlesex Hospital in United Kingdom started and later published their initiatives in UGOE as a two-week clinical rotation with a series of seminars on oncology and cancer care [34].

In 1988, the European Commission/European Organization for Research and Treatment of Cancer (EORTC) Workshop held in Bonn proposed a curriculum in oncology for medical students in Europe. The main reasons for this were: (i) the recognized deficiency of undergraduate cancer education in many European medical schools; and (ii) the need to ensure that newly qualified doctors possess adequate skills to deal with prevention, early diagnosis, curative management and palliative care [44].

In the same year, Brincker H. concluded in the overview of UGOE in Scandinavia that there is need for (1) better coordination of the curriculum in general oncology with the curricula of other specialty disciplines, (2) two-week period of clinical clerkship in the department of general oncology early in the study, (3) two-week concentrated course in general oncology late in the study, (4) final knowledge test, and (5) adequate funding of cancer educators [41].

In 1990, World Health Organization (WHO) designated a Collaborating Centre for Cancer Education (WHO-CCCE) at the Groningen University Faculty of Medical Sciences in Netherland. This center is continuously aims to: (1) lead in advising about cancer education objectives relevant to cancer care in general practice; (2) continue in the collaboration with the Union International for Cancer Control (UICC) in the UICC/WHO-CCCE cancer education project (since 2007 named WHO-CCCE/UICC cancer education project) assisting medical schools with the development and implementation of a two week course aimed at cancer care in general practice; (3) implement contemporaneous developments in educational methodologies into cancer education programs; (4) assist in the development of standard instruments for evaluation of cancer education programs for both medical students, community physicians, nurses and the dental professions; ..etc [60]

In 1996, WHO-CCCE launched the International Summer School Oncology for Medical Students (ISOMS) at the University of Groningen in Netherland. Later on, this initiative became an international project offering assistance to medical schools that want to implement in their curricula a two-week multidisciplinary cancer course aimed at cancer care in general practice. The approach is bottom-up (based on opportunities in individual medical schools) in-stead of top-down (based on general recommendations and rules established in published studies) [49,61].

In 1997, the Metsovo Statement was signed in April 4th 1997 and became an invaluable report in this regard with many recommendations, amongst which: (1) The overall goal of undergraduate medical education in oncology is to produce graduates with sufficient knowledge and skills, allowing them to deal with cancer patients, always bearing in mind that the goal of undergraduate curriculum should not and cannot be the production of oncology specialists; (2) Each Medical School should have an individual dedicated to the undergraduate curriculum in oncology development; (3) The curriculum should have two main components: (i) disease-orientated bedside teaching and (ii) incorporation of a core teaching period, addressing the main topics of prevention, early diagnosis, basic concepts of treatment and palliative care. This clinical and theoretical teaching in oncology should be followed by a compulsory examination; (4) Undergraduate education in oncology should be fully supported by Medical School funds [62].

Almost concurrently but on another continent, an “Ideal Oncology Curriculum” [12] was developed by an oncology education committee of the cancer council of Australia – a multidisciplinary group of cancer clinicians and educators representing all medical schools in Australia, whose objectives are monitoring and improvement of standards of cancer education in Australian medical schools. The development of this consensus-based curriculum involved extensive consumer consultation across the country. Since then, the ideal oncology curriculum has served as a basis of newly developed medical school curricula and as a guide to development of cancer teaching in other areas, for example, nurse practitioner training and professional development of cancer professionals. This curriculum provides a comprehensive checklist for course design that allows adaptation to local conditions, as well as a checklist against which outcomes can be monitored (Table 1) [17]. This step, followed by the development of the web book “Clinical Oncology for Medical Students” by the oncology education committee of cancer council Australia with contributions by several experts from Australian and New Zealand universities and cancer centres. The aim of this web book is to provide an overview of the principles of cancer care to medical students at their level rather than at trainee level. The latter aims to align with the former to guide the delivery of oncology education to medical students [13].

When we cross the Atlantic Ocean, we realize the evolving efforts in this regard in North America. Tam VC *et al* in their survey recognized that oncology is a separate topic in the curriculum in only half of undergraduate medical programs in Canada. Most educators and learners believed that a standard set of oncology objectives would may be or definitely be useful for learners (92% educators, 90% learners) and that a textbook or Web book focusing on oncology education for medical students would be useful. The inadequacy of preparation is not surprising given that many programs did not have a dedicated oncology curriculum or rotation. Although the quantity of oncology teaching might be slightly less than optimal, fragmentation of oncology teaching and the actual information taught are also part of the problem [30].

In the United States of America, with its advanced medical universities and oncology services, UGOE went through a sequence of developmental steps. In one of the studies that assessed medical students during two periods of 6 years: 1983-88 and 1990-95, researchers found that there was a significant decrease of clinical training and a trend in favor of improved treatment and better prognosis. Accordingly, efforts have to be made to further improve clinical training. Such an investigation should be pursued to check the students' training periodically. This will allow the adaptation and improvement of the teaching, in accordance with changes in patients' conditions and treatments [39]. At the same time, electronic tools with substantial educational applications are now widely available and entered in many aspects in medical education. Mehta MP *et al*, addressed the value of Web-based educational tools for oncology teaching at the second-year medical students. This study was a prospective, randomized study, for 35-hour, image-intensive multi-faculty course, where 103 students assigned to the control group and 61 to the experimental group. Among the conclusions, over 75% of the students found that the Web-based education to be an important additional educational resource [63].

Of interest to add here is the non-university-based UGOE, like that of the European School of Oncology (ESO) (in collaboration with the University of Ioannina in Greece) that was launched in 2004 as an oncology summer course on annual base, and with successful outcomes to date. In this course, about 40 medical students from many countries gathered in one place for five days to learn oncology from selected leaders in this field (after passing a competition). The course is a clinically orientated and interactive course. It covers epidemiology and prevention of cancer, biology of cancer, and basics in surgical oncology, radiation oncology and systemic treatment. It mainly deals with all "big killers", i.e. breast, lung, head-neck, colorectal, gastric, prostate and uterus/ovarian cancers as well as "curable tumors" such as lymphomas and testicular cancer and in addition pediatric and adolescence oncology. It also teaches paraneoplastic syndromes, emergencies in oncology, introduction to clinical trials as well as issues of supportive and palliative care. Presentation and discussion of clinical cases are provided after each clinical topic. Videos on radiotherapy or surgical techniques are also projected. At the end of each day there is an examination which consists of 30–40 multiple-choice questions based on the topics taught during the day. An educational ESO book of 500 pages with short written chapters, references, copies of all presented slides and case presentations is provided to all participating students [45,64].

Among the developing nations, Amgad M *et al* in his review in 2012 [54] stated that his search resulted in 40 articles in total. Studies assessing knowledge of oncology among recent medical graduates and general practicing physicians in developing countries were 10 (one of them from Arabic community, Egypt [55]). Studies on oncology summer schools and training workshops in developing countries were 8 (two of them from Arabic communities, Egypt [53] and Lebanon [57]). If we come to the country where this review emerged (Iraq), we can say that as recently as the 1970s, this land has enjoyed a strong healthcare system and universal access to health care and good medical education. But having suffered three shattering conflicts and unstable political life in the past 35 years [65], UGOE like other aspects of life suffered and needs significant improvement. This single institution initiative is one of the steps in this regard.

Single institution experience from Iraq

10 lectures were given in a condensed course over two days during the last month of 4th year UGME students (of a six-year MB ChB program). Lectures' topics were: introductions to oncology; cancer early detection, prevention and awareness; cancer care: global and local perspective; patients' rights, ethics and communication skills; comprehensive cancer care; surgical oncology; radiation oncology; adult and pediatric medical oncology; nursing oncology; palliative and supportive oncology.

Pre-course survey (Appendix 1) and post-course survey (Appendix 2) were distributed to the students and analyzed. Participants were 40 in total. Male:Female ratio was 1.4:1. Comparison of the two surveys (Table 2), the former survey filled by 41 students, 17% of them chose oncology as a future career and 54% indicated that the current oncology hours are not sufficient (that is ranged 6-9/annum). The latter survey filled by 37 students, 51% mentioned that oncology hours should be ranged (8-25/annum) (compared to a proposed range of 12-70 in the pre-course, p 0.001) and 84% of them stated that setting oncology standards is useful. 49% preferred a voluntary summer oncology course. Topics that should be included as core competencies in UGOE syllabus are in sequence: diagnosis and treatment of cancer, basics of oncology and public health, general knowledge of common malignancies and finally the complications, prognosis, and communication in oncology (Figure 1).

Discussion

This is the 1st report in Iraq and among the few reports in Arab communities [53-55,57] that addressed UGOE. Our study has certain limitations in that it is a mini-literature review and a single institution experience.

Inadequate UGOE leaves many practicing physicians ill-prepared. All practitioners benefit from some knowledge of cancer, especially those practicing in rural areas. To deliver appropriate standards of cancer teaching, an undergraduate program should incorporate a national or international standard curriculum and a minimum number of essential experiences. Because assessment drives education, students' knowledge, skills, and attitudes relating to cancer should be assessed, and the outcomes of such assessment should inform further development of the curriculum [16].

Among the challenges facing this issue in medical schools are: insufficient resources, lack of integrated multidisciplinary educational activities, lack of clear consensus on content of a curriculum in oncology [41]. Many experts in the field believe that UGOE remains inadequate in many medical schools. If the newly-qualified doctor is to be provided with the necessary knowledge and skills to participate as a non-specialist in the prevention, early diagnosis and management of malignant disease, it is essential that attention is focused on the development of a satisfactory curriculum for undergraduate education. Only 41% of schools reported that they had a curriculum in oncology. Less than 50% had a pre-degree training period (that is a specific allocation of time for oncology in the final clinical year). Only one-third of the schools had an examination in oncology [6].

K. H. Robert et al reported that there was a wide variation in educational practice between different universities in the same country in Europe. Only 50 % of the medical schools in the United Kingdom, Germany, Spain and Denmark, for example, had courses in oncology. Undergraduate education in oncology is poorly structured at many universities and in a substantial number of institutions even absent [6]. For radiation oncology (RO) at the UGME, Clayton R. & Trotter T. found in their study that most students receiving less than two hours of RO teaching and that the amount of RO teaching at the UGOE is minimal within Canadian medical schools [31].

In another study that dealt with level of knowledge, attitude and exposure to oncology and palliative care at one of the medical schools, 29% of the students had rarely visited the radiotherapy and oncology unit. There were profound deficiencies in the basic knowledge of cancer (46%), principles of radiotherapy treatment (59%), palliative care (64%), and cancer prevention (48%). The students reported no specific teaching about early detection of common malignancies and cancer prevention. The main input of instruction about cancer came from surgery (46%) and pathology (28%) teachings [48].

As the undergraduate cancer education programs usually involve diagnosis and treatment of various organs and tissues of the body that are invaded by this disease, thus, teaching organ system-based oncology by different disciplines causes a fragmented structure of knowledge with difficulty on integrating the knowledge for the real patient. To bypass this problem, an integrated, problem-based multidisciplinary clinical cancer management course has been introduced to fifth-year students at one of the Turkish medical schools. The course consisted of group studies, panel discussions, site visits to departments involved in diagnosis and treatment of cancer, and lecture tutorials enriched with interactive learning methods. Overall assessment of the course has been encouraging in terms of a clinical approach for students to the cancer patient [47].

Gaffan *et al* concluded that involvement of patients in teaching is popular with students and portfolio learning is a successful way of involving patients; the use of standardized patients to teach breast examination improves students' performance in clinical assessment. The use of silicone models to teach breast examination improves students' sensitivity for detecting breast lumps. Computer aided learning modules have a role, but are not superior to other types of learning .Learning about cancer screening and prevention increases students' knowledge, improves their self-rated skills, and changes their behavior. Cancer patients have an important role to play in teaching undergraduate communication skills. Oncology teachers should consider adopting evidence based approaches and there should be more emphasis on educational research within the field of oncology [5].

One of the improvements in this field is an intensive course in oncology at different levels. This short summer program for medical students aims to increase knowledge of cancer care in general health practice, to reduce fear related to contacts with patients with malignant disease, and to expose them to cancer-related problems. This course (as in one of the studies) increased students' knowledge significantly (p = 0.001) with a slight change in attitudes towards cancer-related problems. This improvement was obvious in the overview of the field of oncology, awareness of the psychosocial aspects of cancer care, and the approach to cancer patients, which was appreciated more than the knowledge gain [66,67].

In building a cancer prevention curriculum at the undergraduate level, it is essential to use hands-on instructional strategies that allow students opportunities to practice the required skills. Practice plays a role in knowledge acquisition. This cancer prevention curriculum enhanced the students' knowledge, counseling skills, and screening skills [22]. One of the useful learning tools in the undergraduate oncology education is the portfolio. A model based on a one to one relationship between a student and a patient with cancer has become a core module within some of the universities. The project combines the powerful impact of a one to one interaction with an active investigative and reflective approach to issues triggered from that patient's cancer journey. The aim is to provide each medical student with an understanding of the impact of a malignant disease and its treatment on patients and their families through the experience of the cancer patient. The benefits of the project cover the areas of attitudes, skills and knowledge. Students are assessed on their involvement with the patient, in tutorials and on their portfolio, in which they record all aspects of the project [37].

Educators should consider the potential benefits of tailoring oncology curricula to meet community-specific needs and involving more oncologists within multidisciplinary teams in medical school instruction. The scope of the oncology curriculum has grown over the past decade. Nevertheless, further work is needed to improve medical student knowledge of cancers, particularly those relevant to public health needs. Defining minimum curricular content, emphasizing content based on population needs, and ensuring educational delivery with the support and expertise of oncologists and non-oncologists are essential next steps [29].

Conclusions

Several publications, using surveys, have attempted to investigate the status of oncology curricula in medical schools and to measure the knowledge levels of medical students in cancer medicine. During the last four decades, academic bodies in Australia, Europe, USA, Canada and other regions questioned medical students to assess teaching about cancer in their own medical schools. Most results demonstrated that appropriate integration of oncology is limited in many medical schools, especially in relation to cancer prevention, bedside teaching and palliative care [43]. The target of UGOE should not only be the provision of updated medical knowledge, but also the development of a proper attitude towards all cancer-related issues [51]. There is a pressing need to intervene, in multiple ways, to improve oncology teaching in the various medical schools worldwide. This is especially important for developing countries, where the burden of cancer is increasing [54].

Our preliminary findings point to a trend that the current UGOE warrants further development. Assessment of the need for the ideal hours significantly improved after this course. Universities with limited research resources can use the Australian book (ideal oncology curriculum) [12] and its companion (Clinical Oncology for Medical Students) [13] with the required modifications to make them suitable to their communities. Globally, UGOE needs to be addressed in future studies to build a global consensus in this regard.

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Table 1: 8 areas and 30 topics that needs to be covered in the suggested Australian oncology curriculum [12]

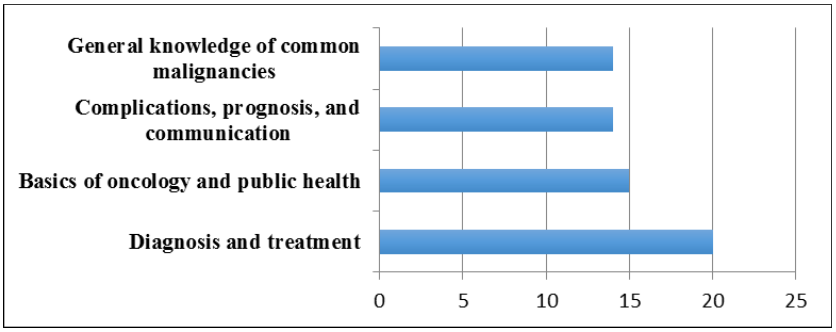
	Areas		Topics
I.	**Public health**	1.	The role of cancer in population health and illness
		2.	Cancers – epidemiology, risk factors
		3.	Prevention, screening, and family risk
II.	**Cancer biology**	4.	Functional anatomy
		5.	Physiology
		6.	Pathology
		7.	Molecular biology
III.	**Patient management**	8.	Patient management including referral and multidisciplinary management
		9.	Quality of life, therapeutic ratio and resource costs
		10.	Uncertainty and information management
IV.	**Diagnosis**	11.	Clinical examination
		12.	The diagnostic process
V.	**Treatment**	13.	General principles of treatment
		14.	Principles of surgery
		15.	Principles of radiotherapy
		16.	Principles of systemic therapy
		17.	Principles of palliative and supportive care
		18.	Follow up
		19.	Treatment of Relapse
VI.	**Communication skills**	20.	Psychosocial and cultural significance of cancer
		21.	Communication and counselling
		22.	Education of patients
		23.	Family and community support
VII.	**Ethics**	24.	Ethics and professionalism
VIII.	**Clinical experience**	25.	Essential clinical experiences
		26. - 30	Five most common cancers in Iraq (breast, lung, CNS, bladder, leukemia)

Table 2: Results of pre-course and post-course surveys.

Survey items	**Pre-Course responses**	**Post-Course responses**	**Comparison**
Number of Students	41	37	Average: 39
Sex (Male/Female)	26/15 (1.7/1)	20/17 (1.2/1)	M/F: 1.4/1
Oncology as a career? (Yes/No)	7/34 (17%/83%)	5/32 (14%/86%)	---
Current hours of oncology education	Range 6-9 hours	---	---
Ideality of current hours of oncology education? (Yes/No)	Yes= 19 (46%) No= 22 (54%)	Yes= 18 (49%) No= 19 (51%)	P value = 0.791* P value= 0.785*
Expected ideal hours of oncology education per annum?	Range 12-70 hours Mean ± SD (32.5 ± 12.9)	Range 8-25 hours Mean ± SD (17.9 ± 9.3)	P value = 0.001**
Is there is a set of oncology **objectives** for medical students? (Yes/No)	28/12 [1 empty]	---	---
Is there is an oncology **curriculum** at your medical school? (Yes/No)	22/18 [1 empty]	---	---
Is there is a **recommended oncology textbook or other reference resource** for medical students? (Yes/No)	18/23	---	---
Would a standard set of oncology objectives, curriculum, and reference resource be useful? (Yes/No)	Yes= 29 (72.5%) No= 11 (27.5%)	Yes= 31 (88.6%) No= 4 (11.4%)	P value = 0.087* P value= 0.079*
Would you attend a **voluntary summer oncology course**? (Yes/No)	14/27	18/19	---

* Independent two samples t-test (for the difference between two means)
** Independent two samples z-test (for the difference between two proportions)

Figure 1: Topics that should be included as core competencies in oncology to medical students



Appendix 1: Pre-Course Survey

1. What is your gender? Male Female
2. Do you plan on pursuing a career in oncology in your future (for example, radiation oncology, adult medical oncology, surgical oncology and its subspecialties, pediatric medical oncology, gynecologic oncology, palliative oncology, geriatric oncology)?
   Yes No (if Yes, put line under the specific mentioned cancer specialties)
3. How is oncology taught to the students at your medical school?
   As a separate syllabus Part of other syllabi
4. Is there a **separate block of time** at your medical school where oncology is taught?
   Yes No (if Yes, mention the number of hours for oncology curriculum)
5. Do you believe the **amount of oncology education** provided in your medical school's current curriculum is ideal?
   Yes No (if No, how many hours in your mind is required?)
6. Do you believe that by the conclusion of your current medical school training that you will have received adequate teaching in the following categories of illness? (Draw line under the answer/s).
   Cancer Endocrinology Gastroenterology Hematology CVS Disease
   Neurology Nephrology Respirology Rheumatology Infectious Diseases
7. Is there a set of oncology **objectives** for medical students at your medical school?
   Yes No
8. Is there an oncology **curriculum** at your medical school?
   Yes No
9. Is there a recommended **oncology textbook or other reference resource** for medical students at your medical school? Yes No
10. Would a standard set of oncology objectives, curriculum, and reference resource be useful for medical students?
    Yes No
11. Would you attend a **voluntary** summer school course in oncology if one was developed for medical students across country? Yes No
12. Which of the following oncology topics **are taught &/or should be included as core competencies** in oncology to medical students?

- **Basics of oncology and public health** (Cancer biology, Cancer epidemiology and risk factors, Prevention of common malignancies, Screening for common malignancies)
- **Diagnosis and treatment** (General approach to diagnosis in patient with suspected cancer, General principles of staging cancers, General principles of treatment, Principles of surgery or surgical oncology, Principles of radiotherapy or radiation oncology, Principles of systemic therapy or medical oncology, Principles of palliative care, Management of common malignancies)
- **Complications, prognosis, and communication** (Common complications of cancer, Common complications of cancer treatment, Prognosis of common malignancies, Breaking bad news)
- **General knowledge of common malignancies** (Lung, Breast, GIT, Brain, Leukemia, Lymphoma)

13. Are there any additional topics not listed that you believe should be included as core competencies in oncology for medical students? Yes No (if Yes, kindly to mention what you think about this)

Appendix 2: Post-Course Survey

1. What is your gender? Male Female
2. Do you plan on pursuing a career in oncology in your future (for example, radiation oncology, adult medical oncology, surgical oncology and its subspecialties, pediatric medical oncology, gynecologic oncology, palliative oncology, geriatric oncology)?

   Yes No (if Yes, put line under the specific mentioned cancer specialties)
3. Do you believe the **<u>amount of oncology education</u>** provided in your medical school's current curriculum is ideal?

   Yes No (if No, how many hours in your mind is required?)
4. Do you believe that by the conclusion of your current medical school training that you will have received adequate teaching in the following categories of illness? (Draw line under the answer/s).

Cancer	Endocrinology	Gastroenterology	Hematology	CVS Disease
Neurology	Nephrology	Respirology	Rheumatology	Infectious Diseases
5. Would a standard set of oncology objectives, curriculum, and reference resource be useful for medical students?

   Yes No
6. Would you attend a **<u>voluntary</u>** summer school course in oncology if one was developed for medical students across country? Yes No
7. Which of the following oncology topics **<u>are taught &/or should be included as core competencies</u>** in oncology to medical students?

- **Basics of oncology and public health** (Cancer biology, Cancer epidemiology and risk factors, Prevention of common malignancies, Screening for common malignancies)
- **Diagnosis and treatment** (General approach to diagnosis in patient with suspected cancer, General principles of staging cancers, General principles of treatment, Principles of surgery or surgical oncology, Principles of radiotherapy or radiation oncology, Principles of systemic therapy or medical oncology, Principles of palliative care, Management of common malignancies)
- **Complications, prognosis, and communication** (Common complications of cancer, Common complications of cancer treatment, Prognosis of common malignancies, Breaking bad news)
- **General knowledge of common malignancies** (Lung, Breast, GIT, Brain, Leukemia, Lymphoma)

8. Are there any additional topics not listed that you believe should be included as core competencies in oncology for medical students? Yes No (if Yes, kindly to mention what you think about this)

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The E3O (Expertise and Evidence in PharmacoEconomics and Outcomes) partnership of the University of Arizona and the Ministry of Health, Kingdom of Saudi Arabia

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Summary

The E3O Partnership between the Ministry of Health, Kingdom of Saudi Arabia, and the University of Arizona Center for Health Outcomes and PharmacoEconomic Research (HOPE Center) is a comprehensive academic-public partnership to improve the quality, efficiency, and outcomes of medication use and pharmaceutical care in the Kingdom through an integrated program of workforce development, research and innovation, and translation. It supports the Kingdom's commitment to assuring its citizens with access to quality and affordable healthcare – evidenced by the current and planned healthcare infrastructure, the commitment to healthcare workforce development, and the adoption of healthcare innovations and technologies. Saudi Arabia is facing the financial realities of advances in healthcare due to new insights in diseases and the associated progress in diagnostics, treatment, and monitoring; sustained population growth; and the interaction of both. The HOPE Center, one of the first of its kind worldwide when established in 1986, provides research, innovation, translation, and education services – focusing on three continua: molecules to models (M2M), patients to populations (P2P), and empirics to evidence (E2E).

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The Ministry of Health operates over 250 hospitals and over 2100 primary care centers, providing healthcare to about two-thirds of the Saudi population. Pharmacy services and pharmaceutical care are provided under the supervision of a growing cadre of pharmacists. Saudi Arabia faces the challenge of balancing its policy of access to medications with the rising cost of pharmaceuticals, enhancing the efficiency and effectiveness of medication use, and achieving the best possible patient and population outcomes. In order to meet these challenges, the Ministry of Health aims to improve the quantity and quality of the pharmacy workforce in its health system through education and training, the efficiency and effectiveness of pharmaceutical care through research and innovation, and the integration of both through translation.

The education and training component of the E3O partnership includes formal academic and postgraduate education in the US as well as long, short, and advanced professional development courses offered in both the US and Saudi Arabia. The research and innovation component is focused on outcomes and economics studies in priority areas of medication use and pharmaceutical care. The translation component emphasizes the integration of novel models and methods in pharmaceutical care and healthcare delivery. The E3O collaboration is believed to be a replicable and sustainable model of academic-public partnerships to build capability and capacity.

INTRODUCTION

The E3O Partnership between the Ministry of Health, Kingdom of Saudi Arabia, and the University of Arizona Center for Health Outcomes and PharmacoEconomic Research (HOPE Center) is a comprehensive academic-public partnership to improve the quality, efficiency, and outcomes of medication use and pharmaceutical care in the Kingdom through an integrated program of workforce development, research and innovation, and translation. The acronym E3O, which stands for Expertise and Evidence in PharmacoEconomics and Outcomes, reflects the major tenets of the partnership: to build expertise (workforce development) and develop evidence (research and innovation) to enable sustainable and affordable (economics) pharmaceutical care (translation) to achieve better patient outcomes.

The long-term objective of E3O is to assist the Ministry of Health in its strategic priority of building its capability and capacity in pharmacoeconomics, outcomes evaluation, and health technology assessment. More specifically, the aim of the E3O program is:

- to build, gradually and over time, the internal expertise in pharmacoeconomic analysis, outcomes, evaluation, and health technology assessment within the Ministry of Health;
- to adopt in this an evidence-based approach; and
- to integrate the economic aspects of medication use with the outcomes of appropriate medication use as the measure of value to be achieved.

In this effort, we emphasize the importance of optimizing positive outcomes and the efficiencies and synergies this creates; but also the significance of preventing negative outcomes and the associated cost avoidances that can be achieved.

E3O is grounded in a developmental perspective. The intent is:

- to enable a rapid start by the Ministry of Health in implementing its Vision for 2020 in as far as medication use is concerned;
- to embed internal capability and capacity within the Ministry of Health; and
- to provide external capability and capacity on an interim basis - higher at the beginning of the E3O Program but designed to decrease as internal capability and capacity grows.

A core assumption is that, in addition to Education and Training, capability is built through exemplar projects in Innovation and Translation that address an innovation need, enable translation of methodology and evidence, so that systematic, replicable, and sustainable processes and systems can be developed and implemented.

In this paper, we first summarize the vision and mission of the Ministry of Health as they guide the E3O partnership. Next, we describe the background and context of the partnership. This is followed by a description of the HOPE Center. We then summarize key elements of the E3O program, focusing mainly on the Education and Training components and their associated research experiences, as these are closest to implementation.

VISION AND MISSION OF THE MINISTRY OF HEALTH

E3O is based on and aligned with the Vision and Mission of the Ministry of Health, and how these have been translated into a vision for the period ending in 2020.

Vision

"The Ministry of Health […], by way of its objectives, policies and projects, seeks to accomplish a promising future vision; namely, delivering best-quality integrated and comprehensive healthcare services."[1]

Mission

As stated on its website, the Ministry of Health "is committed to the mission assigned to it since its first coming into being; i.e. the provision of healthcare at all levels, promotion of general health and prevention of diseases, in addition to developing the laws and legislations regulating both the governmental and private health sectors. Aside from that, [the Ministry of Health] is accountable for performance monitoring in health institutions, along with the research activity and academic training in the field of health investment."[1]

Vision for 2020

These vision and mission statements guide the Vision for 2020 articulated by the Ministry of Health:[1]

- "Carrying health conditions or health status of Saudi inhabitants to the best and highest possible level, in terms of justice and equality in providing healthcare, and in terms of effectiveness and the possibility of incurring the financial burden of the treatment and healthcare. In doing so, the [Ministry of Health] takes as its target meeting citizens' aspirations in this regard, by providing them with high-quality general and specialized health services, and covering all the population with these services."
- "Creating a sole and exclusive entity to formulate health policies […]."
- "Adopting a public and national health strategy which focuses on the main morbidity burdens; including non-communicable diseases, nutrition, reproductive health, smoking (tobacco-use), AIDS, traffic accidents, and injuries."
- "The system must have an effective and fair methodology for estimating risks and benefits."
- "Working to diversify sources of revenues to finance the system effectively. These sources must include also public revenues and insurance premiums, in addition to the equally allocated costs and taxes."

BACKGROUND AND CONTEXT

The E3O Initiative comes at a critical juncture in the health and pharmacoeconomic policy planning of the Kingdom of Saudi Arabia. The Kingdom, represented by the Ministry of Health, has been eminently committed to assuring its citizens with access to quality and affordable healthcare. This is evidenced by the current and planned healthcare infrastructure, the enduring commitment to healthcare workforce development, and the proactive adoption of healthcare innovations and technologies.

Saudi Arabia is also facing the financial realities of advances in healthcare due to new insights in diseases and the associated progress in diagnostics, treatment, and monitoring; sustained population growth; and the interaction of both. This calls for an assessment of the economic impact of the Kingdom's continued commitment to accessible healthcare for its citizens. Whereas in most countries this has taken the form of restricting patient access to care (or, at least, increasing the barriers to care), the Kingdom has chosen to pursue a general strategy of economic management of healthcare expenditures at the national and less so at the patient level.

Demographic and Epidemiological Factors

It is important to place both the Kingdom's societal commitment to healthcare and its approach to health and economic policy within the evolving demographic and epidemiological trends within Saudi Arabia. According to such sources as the 2011 Statistical Yearbook of the Ministry of Health and the World Bank, the 2010 census estimated the Kingdom's population at approximately 29 million people, an increase by 19% from 2004 and by 62% from 1992. Of these about 20 million are Saudis. The population is projected to increase by another 38.5% by 2025 to reach well over 37 million inhabitants. Estimates of the population growth rate range from 2.9% to 3.2%, with the growth rates for Saudis estimated at 2.2%.

Currently, the life expectancy at birth is 72.7 years for males and 75.1 years for females for a population rate of 73.8 years. The Saudi population is relatively young. Of the total population, 11.2% is below the age of five, 31.4% is below the age of 15, and 65.7% of the population is between the ages of 15 and 64. Only 2.9% of Saudi's are age 65 or older. The crude birth rate is 22.9 per 1000 population compared to a crude death rate of 3.9 per 1000 population.

The 2011 Health Statistical Yearbook[2] summarizes the epidemiological profile of the country; the current investments by the Kingdom in primary and secondary healthcare facilities, including the associated human resource commitments; and the healthcare services, outpatient and inpatient, provided through the Saudi healthcare infrastructure. With the relative affluence from sustained economic growth over the past decades, the country has witnessed a shift towards chronic illness and diseases of longevity. The epidemiological profile is increasingly aligning itself with that seen in mature Western economies.

Healthcare Infrastructure

The Saudi government recognizes that the current public healthcare infrastructure is insufficient to accommodate the projected needs of the country. Whereas in 2011 there were 251 public hospitals under the authority of the Ministry of Health, this is estimated to increase to 325 to 350 hospitals in the years to come. The increased access to tertiary (inpatient) care thus achieved, but also the access to secondary (outpatient) care by specialists, will have considerable budget impact on national (public) healthcare expenditures. The 2109 primary healthcare centers in Saudi Arabia under the authority of the Ministry of Health are likely to expand in numbers if not size as well.

The Ministry of Health's responsibility for the full spectrum from primary to tertiary public care, whether in today's infrastructure or in the infrastructure being developed for the (near) future, poses a significant challenge to planning and implementing change. The mere size of the healthcare system requires that knowledge, systems, and process improvements be systematic, scalable, replicable, internally sustainable, and externally affordable.

Pharmaceutical Expenditures

In 2010, pharmaceutical spending in Saudi Arabia totaled $3.5 billion including $1.4 billion in the public and $2.1 billion in the private sector. Pharmaceutical expenditures constituted approximately 4% of GDP and 18% of total health expenditures. Saudi Arabia is the largest pharmaceutical market in the Gulf countries. The country relies substantially on imports of pharmaceutical products, primarily from Europe, to meet local demands as a result of insufficient domestic production and limited research and development capabilities.

The pharmaceutical rates of 4% of GDP and 18% of healthcare expenditures for the Kingdom are similar to those of other member states of the Gulf Cooperation Council. Thus it may be possible to translate and leverage innovations in knowledge, system, and processes in Saudi Arabia to other member states and achieve even greater efficiencies and economies of scale in medication use.

The cost of pharmaceuticals is rising steadily worldwide as a function of demographic and epidemiological shifts and significant advances in medicine, pharmacology, and pharmacotherapy. In Saudi Arabia, this poses a challenge to the balance between the Kingdom's policy of access to medications and related expenditure. Some of the key strategies for pharmaceutical cost management utilized in most Western countries may have limited application in Saudi Arabia because of national health policy and corresponding pharmacoeconomic policy. Setting constraints at the patient level does not seem within scope in Saudi Arabia. Rather, in the foreseeable future the emphasis is on the acquisition cost of medications at the national level and on cost avoidance through increased efficiencies in medication use. This does not mean that analysis in support of Saudi pharmacoeconomic policy should employ different methods than those used elsewhere; only (and fundamentally) that they should use appropriate inputs and produce relevant outputs.

Workforce Development

In parallel with this is the need for (and budget impact of) workforce development across the full healthcare spectrum. The position of pharmacists within the workforce is relevant to the E3O partnership. Saudi pharmacists work either in the governmental or in the private sector. According to the 2011 Health Statistical Yearbook[2], there were 1837 pharmacists, 1090 of whom were Saudi, in the government sector, including 1487 employed in Ministry of Health hospitals. There were 6373 private pharmacies employing a total of 10,602 pharmacists. Coupled with the 981 pharmacists working in private clinics and hospitals, the private sector employed 11,583 pharmacists in 2011. Currently, over 5000 students are enrolled in 17 pharmacy schools in Saudi Arabia.

Privatization of Health Insurance

A final factor to be considered is the Kingdom's plan to migrate the management of healthcare benefits to private health insurance companies. As the incentives of these companies are likely to be different from the public trust function of the Ministry of Health, it is critical that the Ministry have in place the scientific, analytic, and technical capability to set the level for, and monitor the metrics of efficiency, effectiveness, quality, and access to care to so hold insurance providers accountable.

Implications for the E3O Partnership

In summary, developing expertise and evidence in pharmacoeconomics and outcomes to support rational pharmacoeconomic policy for the Kingdom of Saudi Arabia is dependent on the development of translation, research, and education capability and capacity.

At the translation and research levels, the emphasis should be on such strategic and scientific priorities as:

- acquisition costs and pricing methods;
- assessment of comparative value of drugs relative to the Saudi healthcare system;
- patient and population outcomes achieved under variability in treatment patterns;
- reallocation of savings from generics and biosimilars in certain therapeutic areas to improve access to treatments still under patent-protection in other therapeutic areas;
- cost avoidance as a function of improvements in medication safety, reductions in medication errors, prescriber adherence to clinical and administrative guidelines, and patient adherence to medication regimens;
- comparative pharmacoeconomic policy analysis; and
- analysis, adaptation, and application of best practices in pharmacoeconomic policy developed in other markets, jurisdictions, and countries.

For this to succeed it is essential to build capability and capacity within the Ministry of Health by:

- growing the workforce in terms of scope, levels, and specialization;
- building the technology infrastructure;
- developing systems and processes; and
- adopting an approach in which capability and capacity gradually move from assistance and substitution to internal operations and management and achieve the desired level of excellence.

THE HOPE CENTER

History

The Center for Health Outcomes and PharmacoEconomic Research, an Arizona Board of Regents Center of Excellence, was established in 1986 by J. Lyle Bootman as one of the first academic research units in the world dedicated to the assessment of health outcomes and the economics of medication use. Its investigators have been at the forefront of innovation in the field of health outcomes and pharmacoeconomic research, its translation to the organization and financing of pharmaceutical care, and its integration into the delivery of quality and cost-responsible healthcare. In Fall 2012 J. Lyle Bootman, Executive Director, appointed Ivo Abraham, a nurse by profession and outcomes and effectiveness scientist by trade, to serve as Director. The charge was to map out new directions in the changing field of health outcomes and economics; diversify the funding base; broaden the Center's scope beyond medications to encompass any interventions and technologies in healthcare; build alliances with other centers on campus and stakeholder groups beyond the University; and provide leadership in late–stage translational research on human therapeutics.

Vision

The vision of the HOPE Center is to serve the University of Arizona, the state, the nation, and the world as a pre-eminent scientific, operational, and policy-enabling operator, incubator, innovator in health outcomes, performance, and effectiveness research and synthesis - through a unique global partnership of academic, healthcare provider, governmental, financial, industry, and philanthropic organizations.

Mission

The Center's mission is to promote interdisciplinary research development and interprofessional education on the outcomes, performance, and effectiveness of healthcare interventions, technologies, and systems - from clinical, economic, and patient-centric views – at the patient, healthcare provider, health system, community, and population levels. The Center aims to optimize the access, quality, and cost of healthcare to generate value for patients, providers, payers, and policy makers; and to foster evidence-based patient care, performance, and policy regionally, nationally, and internationally.

Framework: M2M – P2P – E2E

Today, the HOPE Center's research, training, and service activities are guided by its M2M, P2P, and E2E framework – focusing on interventions that may range from single molecules to models of care (M2M), examining their effectiveness and outcomes from single patients to large populations (P2P), through empirical research programs that build the evidence-bases for patient care (E2E). The motto of the HOPE Center is "Knowledge to Care" and reflects its commitment to develop and disseminate the knowledge *needed to* care – so as to translate science *from* knowledge *to* care.

EDUCATION AND TRAINING

As part of its workforce development program, the Ministry of Health has embraced a broad program of Education and Training activities. These include academic and postgraduate education programs, as well as various professional education initiatives.

Academic and Postgraduate Education

A major priority of the Ministry of Health is to increase the number of Saudi pharmacists with the PharmD degree and with postgraduate general (PGY-1) and specialty (PGY-2) residency training. In addition, the Ministry of Health intends to offer fellowship training to qualified trainees.

As shown in Figure 1, three tracks have been identified that aim for US licensure and subsequent entry into a PGY-1 residency for successful candidates. The University of Arizona has been offering Saudi pharmacists with the PharmD degree an Advanced Certificate Program. As described in greater detail by Katz in this publication, this is designed as a two-year program of an internship year with a minimum of 1500 hours of experiential training and additional education to qualify for US licensure followed by a PGY-1 general pharmacy residency. The Ministry of Health also seeks opportunities for bachelor's (BS) prepared Saudi pharmacists to obtain the PharmD degree through accelerated programs; and for Saudi pharmacy technicians to pursue a PharmD degree. The BS track is currently not offered by the University of Arizona but is in discussion. The pharmacy technician track can be achieved by gaining general undergraduate admission to the University of Arizona, meeting pre-pharmacy requirements, and then applying to the University's PharmD program.

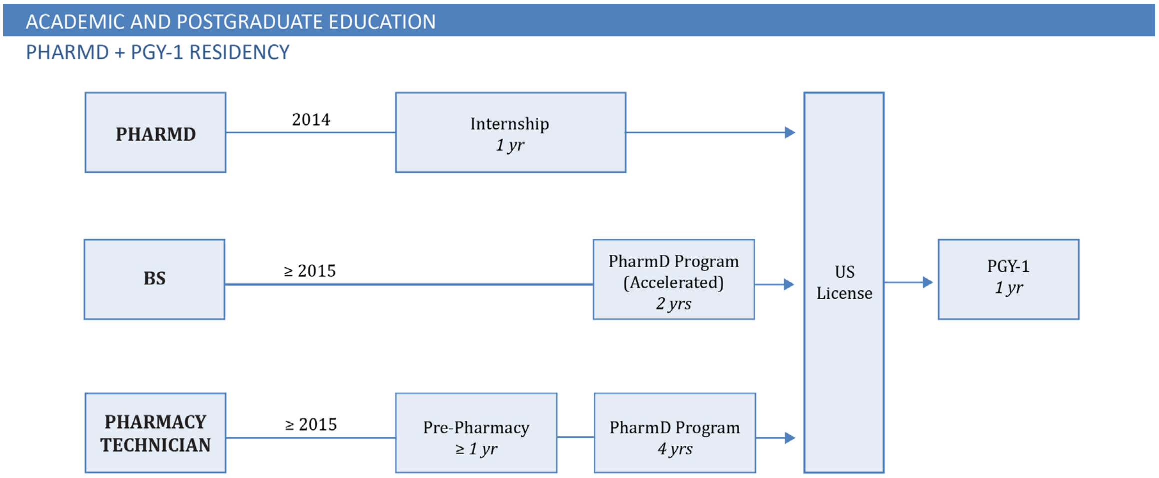


Figure 1. Academic and postgraduate education: PharmD and PGY-1 residency.

Figure 2 summarizes the PGY-2 specialty residency and fellowship options. Two PGY-2 tracks are being developed: a conventional PGY-2 track that emphasizes specialization in a clinical pharmacy specialty and a novel PGY-2 residency in pharmacoeconomics. Both tracks extend in a postdoctoral fellowship option emphasizing mainly research (80%) but with concurrent additional clinical training opportunities (20%).

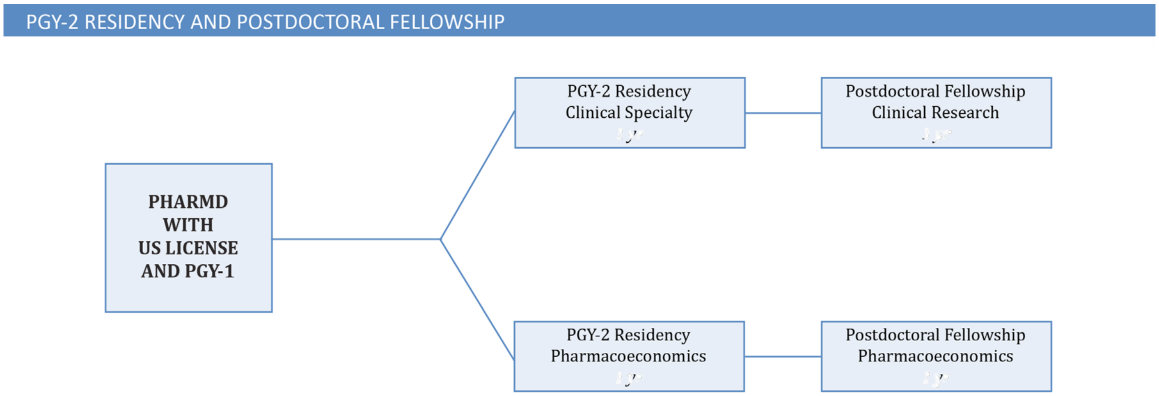


Figure 2. Academic and postgraduate education: PGY-2 residency and postdoctoral fellowship.

The HOPE Center currently offers two postdoctoral (post-PharmD) fellowship programs, one in Clinical Research in Human Therapeutics and one in Clinical Outcomes and Comparative Effectiveness Research; with the latter including a significant pharmaco-economic component.

Professional Education

To address short- and intermediate needs in the professional preparedness of the Ministry of Health pharmacy workforce, three professional education tracks have been conceived: Long Courses of 10 weeks' duration held at the University of Arizona as well as Short Courses of 1 to 2 weeks' duration and Advanced Courses of 3 week's duration offered at different locations in Saudi Arabia, each of which has a follow-on experience of about 6 months. Content-wise, these courses are at a level comparable to graduate courses in MS/PhD programs.

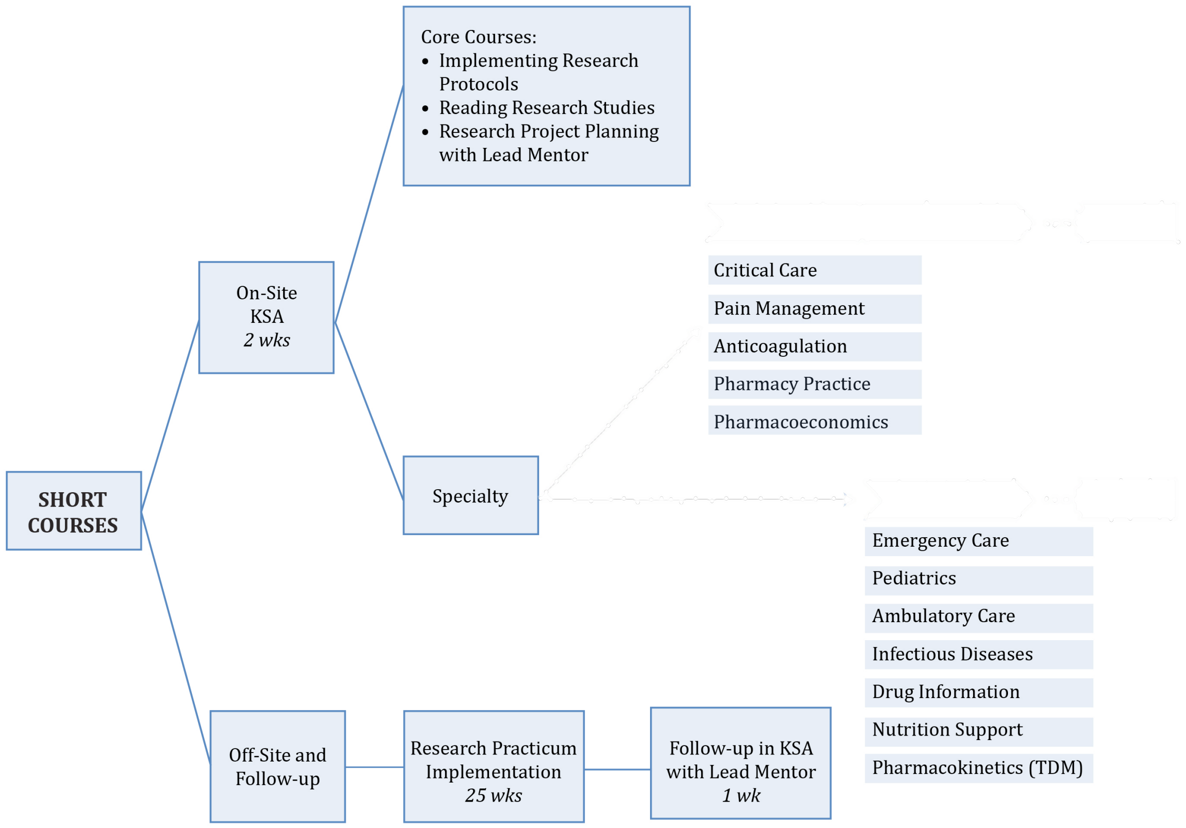
The Long Courses are divided into two tracks: (i) Clinical Pharmacy Services and Research and (ii) Pharmacy Services Research. The Short Courses are all clinical in focus. The Advanced Courses are organized into three tracks: (i) Scientific Development, (ii) Teaching Development, and (iii) Medication Use.

Innovatively, these courses include an introduction to research and a research practicum. The research practicum is linked to evolving studies sponsored by the Ministry of Health in the different concentration areas of the Long, Short, and Advanced Courses. Following a course, trainees return to their work sites and serve as the site investigator for the linked studies.

The Long Courses and the respective two tracks are depicted in Figures 3 and 4. A Long Course includes 10 weeks of training in the US, and consists for 30% of core research methods courses, for 60% of specialty training (with an initial list of topics specified), and for 10% of site visits. Trainees then participate in the corresponding research practicum for about 6 months.

The Short Courses follow a similar pathway as the clinical pharmacy Long Courses, but the content is reduced to fit the shorter time frame. These courses were conceived as two weeks' in duration, though there is discussion about condensing them into an intensive one-week experience (see Figure 5).

PROFESSIONAL EDUCATION: SHORT COURSES



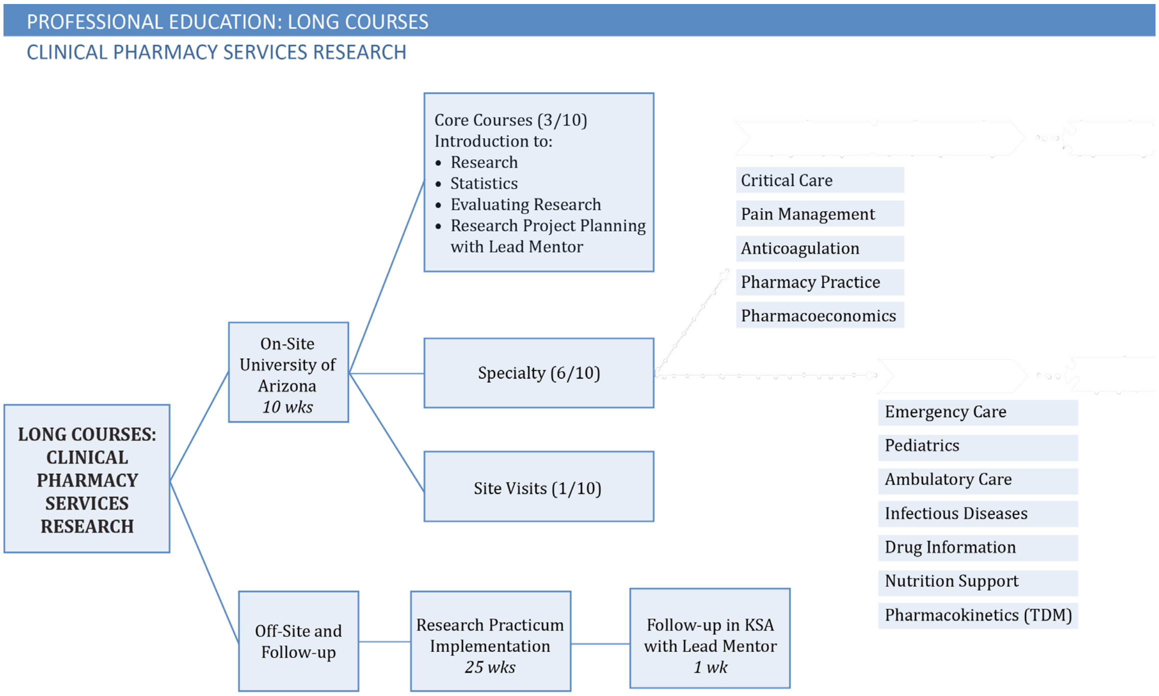


Figure 3. Professional education: Long Courses in Clinical Pharmacy Services Research.

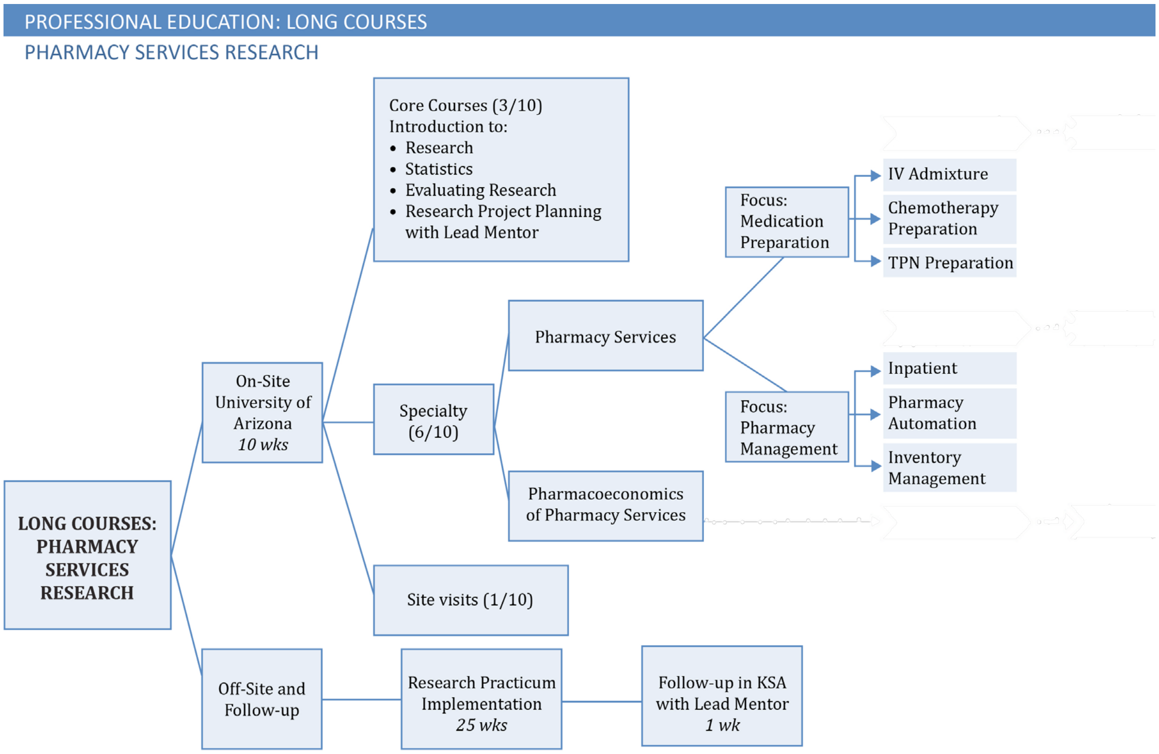


Figure 4. Professional education: Long Courses in Pharmacy Services Research.

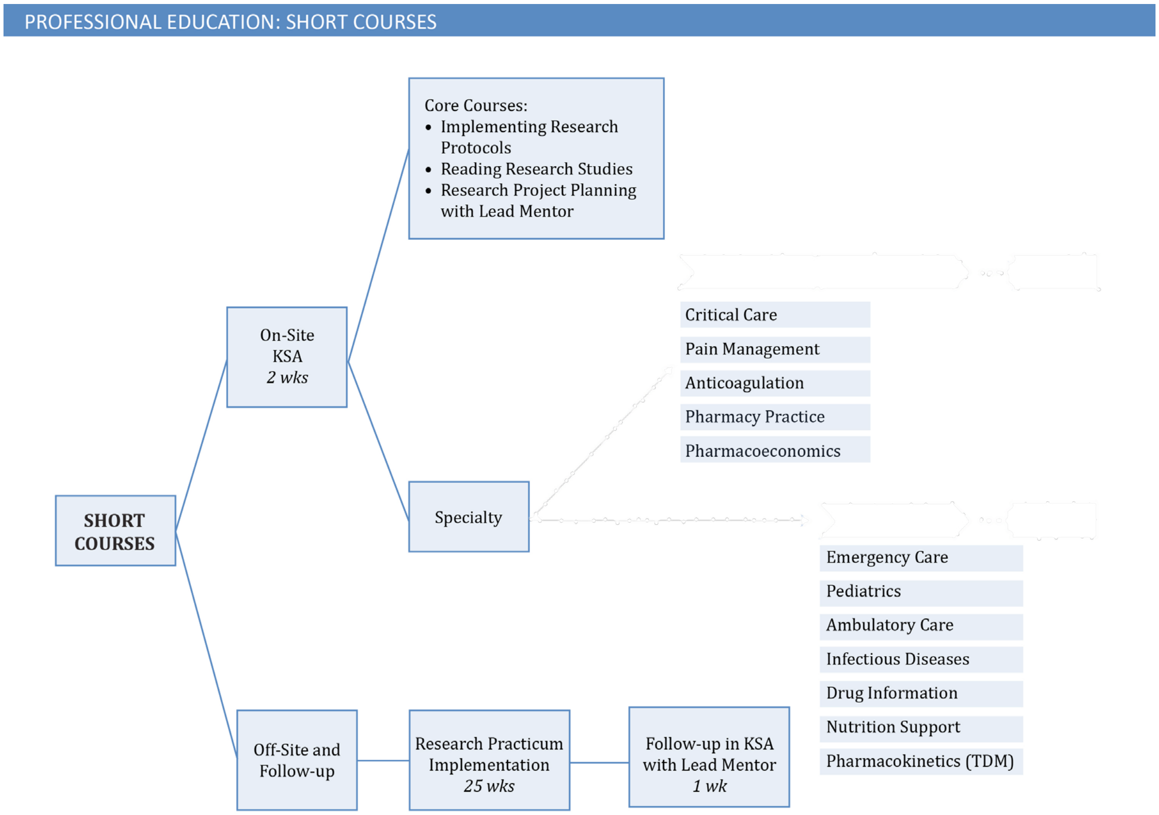


Figure 5. Professional education: Short Courses.

The Advanced Courses are summarized in Figure 6, and include three tracks.

- The Scientific Development track aims to develop a cohort of Ministry of Health pharmacists who can assure operational leadership roles in the planning, coordination, implementation, and dissemination of both controlled and non-controlled medication studies in inpatient and outpatient Ministry of Health facilities. Five subtracts that build upon each other are identified. Except for participants who already have knowledge and skills in any of these tracks, participants with less experience might benefit most if they proceed through all the subtracts over time.
- The Education track has a core and two subtracts, Academic Teaching and Professional Teaching. In all these activities, formal teaching is blended with assignments and experiential teaching exercises.
- The Medication Use track aspires to produce a cohort of Ministry of Health Pharmacists capable of planning, coordinating, and implementing programs and systems that optimize the rational use of medications in patient care to achieve better patient outcomes at lower cost.

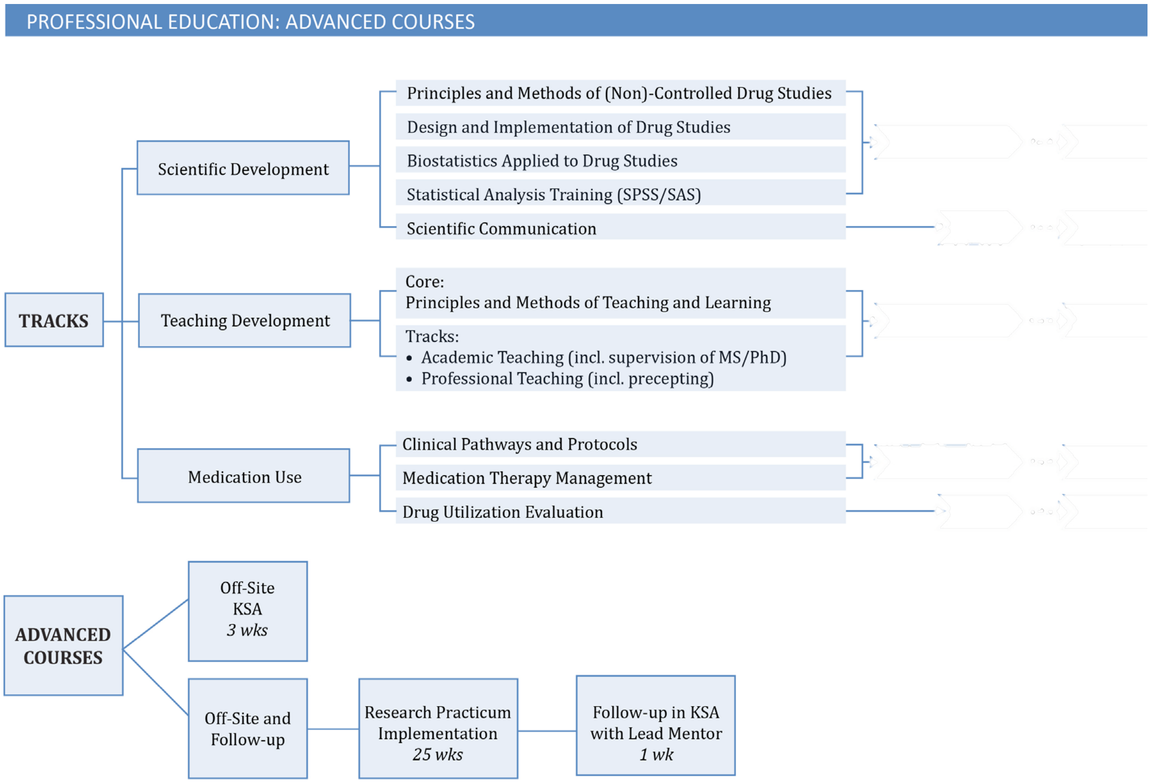


Figure 6. Professional education: Advanced Courses.

Conclusion

The Kingdom of Saudi Arabia faces the challenge of balancing its policy of access to medications with the rising cost of pharmaceuticals, enhancing the efficiency and effectiveness of medication use, and achieving the best possible patient and population outcomes. To this end, the Ministry of Health aims to improve the quantity and quality of the pharmacy workforce through education and training, the efficiency and effectiveness of pharmaceutical care through research and innovation, and the integration of both through translation. In doing so, The Ministry of Health enables the Kingdom's commitment to assuring its citizens with access to quality and affordable healthcare – evidenced by the current and planned healthcare infrastructure, the commitment to healthcare workforce development, and the adoption of healthcare innovations and technologies. The E3O collaboration, an academic-public partnership, is believed to be a replicable and sustainable model of academic-public partnerships to build capability and capacity.

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Designing a Culturally and Linguistically Appropriate Home Caregiving Program: An Example from Jordan

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Abstract

Introduction

Family members play a major role in providing care for long-term dependent patients especially in poor and developing countries, where there is lack of specialized nursing homes and specialized home visit professional. After discharge from hospital, family members are rarely provided by sufficient information or training regarding home caregiving for their ill relatives. There are inadequate caregiving educational resources directed to Arabic speaking caregivers; either in written or in multimedia forms.

Objective

The objective of this paper is to present a caregiving educational program with intention to be culturally and linguistically appropriate for Jordanian and Arab-specific population.

Methods

A caregiving educational program entitled by *"There is a Patient in Our Home"* was part of project funded by Al-Zaytoonah University of Jordan. Seventeen real life caregiving demonstrations were executed as short Audi-visual real films. The focal point of the program was to provide necessary skills, instructions and information which enable caregivers to provide safe and competent daily caring activities for their dependent relative in home.

Results

The educational program was registered in the Jordan National Library and was uploaded on social media sites as YouTube. The number of views on the YouTube exceeded 1000 times during two weeks. The feedback comments received from caregivers were not only by Jordanian but also by people living in different Arab countries or immigrant worldwide. Based on people's feedback, some additional content material will be added to the series in the second version of the program.

Conclusions

This program is an endeavor to supply the Arabic library with home caregiving resource in Arabic language and in a culturally appropriate way. To evaluate its effectiveness, this caregiving program will be amenable for quantitatively investigation through robust experimental studies.

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Introduction

In Arab region, aging is expected to be a priority health issue because of accelerating number of this age group. The number of Arab aged 65 and above is expected to increase to 14 million by 2010 and 21.3 million by 2020[1]. In Jordan, similar to other Arab countries, and due to advancement of health care services, people are living longer lives, however, the degenerative changes, in addition to the prevalence of Non-Communicable Diseases (NCDs) and disabilities increase as population age[2].

For Jordanian people, hypertension, diabetes mellitus, obesity and smoking are risk factors for morbidity[3]. In a report for World Health Organization (2011), the NCDs such as cardiovascular diseases, cancer, and diabetes are creating a new pattern of health problem which is the functional disability in elder population[4]. In addition to the previous diseases, the “four giants of geriatrics,” memory loss, urinary incontinence, depression and falls or immobility are of major causes of disabilities[5].

The functional disability is defined as the capacity of an individual to accomplish the basic self-care activities[6]. Managing elder-health related problems including disabilities are considered as burden issue for health care systems globally[4]. Many of the elders lose their functional and cognitive abilities consequently they cannot live independently or without assistance.

Religious norms and cultural values in Arab countries strongly acknowledge and affirm the vital role of the family in the care of elders, and this is explicitly stated in almost all of the national reports of Arab countries and that explained the low number of institutionalized elders in long term nursing homes[2], since, caring for elders is a family obligation[7].

The living arrangement of elders between his family members and receiving support from them represents the cultural norms of respect and inter-generational ties[8].

In a recent report for United Nations (UN) in 2013[5], the pattern of living independently of older population or living with spouse only, will be common worldwide in near future. Because of the previously mentioned cultural factors, the number of institutionalized older adults remains low in most Arab countries[9,10,11].

The predominant effect of NCDs and functional disabilities among older adults recommend a need for specialized health care services for this age group away from placing older adult in nursing home. Community and family based programs to assist functionally disabled elder population and their caregivers were highly recommended in low and middle income countries[12].

Who are caregivers?

According to National Center of Caregiving, caregiver is any relative (son, daughter, spouse, niece, or nephew, friend or neighbor) who has a significant personal relationship with, and provides a broad range of unpaid continuous and daily base assistance for an older person or an adult with a chronic or functionally disabling health condition[13]. The WHO (2004) defined caregiver as a person who provides formal or informal support and assistance with various activities to persons with disabilities or long-term conditions, or persons who are elderly. Caregiver may provide emotional or financial support, as well as hands-on help with different daily living tasks[14].

Because of the compromised abilities of the care recipients, allotment of care will be on families to assist them in their Basic Activities of Daily Living tasks (BADL) such as bathing, dressing, eating, moving, and toileting, etc., and in Instrumental Activities of Daily Living tasks (IADL) such as shopping cooking, etc[6]. In Arab countries, to achieve optimum quality of life for older adults and their families, a cultural appropriate and Arab family’s tailored home caregiving interventions was recommended[2].

The Home Caregiving Educational Program

One recommendation for Economic and Social Commission for Western Asia (ESCWA, 2013) was to strengthening family's competencies in the care of elder relatives. Furthermore, ESCWA allocated the responsibility of supporting, training and preparing families for home-based caregiving role on health care systems and the civil societies[2]. In Jordan and similar to surrounding countries, there are great effort to promote elders' health through specialized formal medical and nursing educational programs in higher educational institutions[2].

Faculty of Nursing in Al-Zaytoonah University equipped nursing students with theoretical knowledge and skills to enable them to provide competent elder care through formal curricular courses. On other hand, informal and out curricula track of community services are missions of Al-Zaytoonah University of Jordan and the Faculty of Nursing.

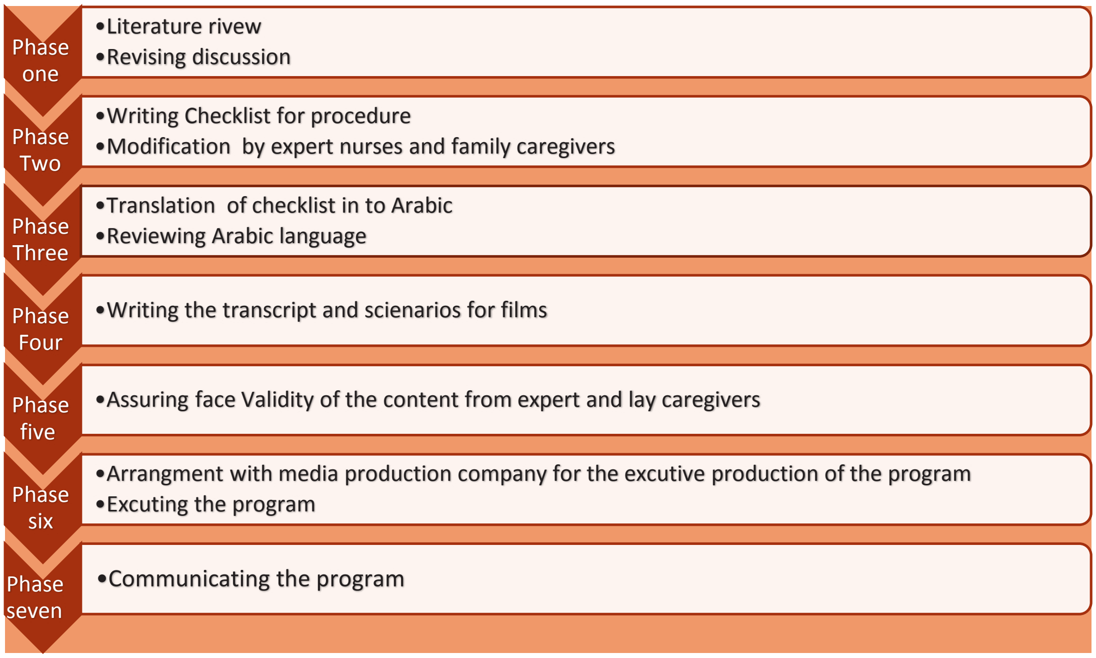
There is a patient in our home program was part of a project which was funded by Al-Zaytoonah University of Jordan as a worthy contribution in Jordan community service in the domain of elder health. The purpose of this paper is to present a prototype of family home caregiving educational program designated to equip Jordanian, Arab, or Arab immigrant families with adequate knowledge and caregiving skills which enabling them to provide competent and safe home caregiving for their functionally disabled or elder relative.

The Process of Designing the Program

The process of designing the program was a challenging task for the researcher. To build similar educational program on a previous body of knowledge, caregiving Arabic literature should be available, and it was not possible to find scientific investigation targeting the project theme. However, this issue could be considered as a significant additional point for the project.

The Designing Process

There is a patient in our home program was created after a thoroughly working process starting from literature review and ending by communicating of the program to the public (Figure 1).



Phase One

A literature search was conducted to review the caregiving data base of CINAHL and MEDLINE. The key search terms were a combination of Jordan/Arab and Caregiver; Jordan/Arab and Home Care; Jordan/Arab and Family care. To ensure an extensive search, the investigator started searching the relevant literature without using time frame. Out of 45 articles, 25 studies fit the inclusion criteria. The investigated studies were conducted in Jordan (7), Kuwait (2), Lebanon (2), Egypt (7), Saudi Arabia (4), Oman (1), and Tunisia (2). Unfortunately, none of the studies was targeting a caregiving educational program. Researcher tried to find other caregiving resources (audio-visual) by blindly examining the most popular searching engines on internet. The researcher used the same searching key words in Arabic language. Using the internet to find Arabic audio-visual caregiving yielded the same result of no availability of the searching quest. However, the most wide world visible media source (You-Tube) presents thousands of caregiving educational programs in English. However, the result of caregiving programs on YouTube site were targeting professional formal caregivers, such as nursing students, home nursing personnel or paid unprofessional personnel. This issue forced researcher to build a unique and original family caregiving program in Arabic language. Consequently, a second run of literature review was conducted to search for the caregivers' needs. Depending on relevant literature, the project team selected the most important and safety-related home caregiving topics to be included in the program. From the BADLs and IADLs in addition to other important caregiving-related issues, seventeen skills and topics were included in the program (Table 1).

Table 1

Caregiving Topics and Skills	
Assisting in walking	Patient room arrangement
Changing position	Mouth care 1
Preventing bed ulcer	Mouth care 2
Home safety	Artificial teeth (Denture) care
Instruction on taking medication	Foot and nail care
Importance of family health education	Hair shampooing
Emotional effect of caregiving on families	Bed bathing
Feeding patients	Bedding
	Changing bed clothes

Phase Two

One day workshop for the project team carried out to write the content material in form of checklist in English language. Developing caregiving procedure in a step-by step-format (Checklist), make demonstration of the caregiving skills more easy and consequential for lay people. The checklists were given to three family caregivers who are able to read English in addition to two expert nurses to revise it and give feedback. The revised English version was carefully modified based on reviewers' feedback.

Phase Three

When the checklists were readily developed, they were given to two independent professional translators for Arabic translation. Noteworthy here that the prime instruction that was given to the translators was to use simple and daily-used terms and phrases in translation to be suitable for lay population. Three caregivers who were recruited from community were asked to read the translated checklist and provide their feedback. The project team received feedback comments from caregivers and consequently they revised the used terminology and replaced them by some synonymous terms suggested by caregivers.

Phase Four

To attract audience, the project team wrote transcripts for real life stories to be video-recorded as caregiving series. The group suggested creating scenario where there is a patient, family caregiver, and additional personnel to play family roles in the films.

Phase Five

To verify the face validity of the caregiving scenarios, and the transcripts, two caregiving experts and two lay caregivers independently read the written material and they provided their feedback. Consequently, the last content and wording modification was conducted by the team.

Phase Six

To execute the program in an artistic professional manner, a series of meetings were set with specialized medial production company for the process of execution of the program. The program was recorded in actual home with symbols and ritual collection of an ordinary, middle class Jordanian family, and without using professional caregiving instruments and tools. For some procedures and skills, the available usual home utensils were used to perform the caregiving demonstration. A key Jordanian famous actor was hired to perform the dependent patient role in the films. During each step of the caregiving skill and topic, verbal commentary and guidance notes were provided by professional commentary reader. To give the program reality effect, two actual caregivers presented their caregiving sufferings and challenges. The total time of the entire seventeen skills was 120 minutes and recorded as seventeen mini films with time range from three to fifteen minutes for each (Figure 2).

Figure 1. There is a Patient in Our Home Program, the cover of the package

Phase Seven

As a first step to maintain the copy right of the program, the project team obtained a formal registration number from the Jordan National Library. To widely communicating the program, the project team uploaded the films on different social media sites such as Al-Zaytoonah University channel on You-Tube [15]. Within two weeks, the number of views exceeded 1000 times. The team received many positive and negative comments.

Language, simplicity and attractiveness of the program were areas of satisfaction by viewers. Verbal commentary guidelines and rational behind each step in caregiving film was a strong point of the program. Viewers expressed dissatisfaction for lack of few subjects such as verbal communicating with patients and dealing with daily caregivers' burden and stressors. One important need expressed by reviewer was to present a caregiving educational program specific to caregivers of particular diseases such as stroke, amputation, and Alzheimer disease. The future plan for the researcher is to investigate the effectiveness of this program through robust empirical and experimental research. However, the effect of the program was explored qualitatively through a phenomenological study[16].

Conclusion

"There is a Patient in Our Home" is a unique prototype of Arabic caregiving educational and training program. This program is a culturally convenience for Jordanian, Arab, and Immigrant Arab caregivers. The program has strong points as well as drawbacks. This program with suggested comments and feedback has a potential to satisfy Arab caregivers' needs in the future editions.

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Healthcare Access and Insurance Among Arab/Chaldean Americans in Michigan

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Abstract/Summary

Background

Although a distinct ethnic cultural minority, Arab/Chaldeans are classified by the US census as white, and therefore are generally not included in federal and state reports on minority health. The Arab Community Center for Economic and Social Services (Dearborn, MI) the Michigan Department of Community Health, and Michigan State, Wayne State and Saginaw Valley State Universities collaborated to conduct a stand-alone probability sample of Arab/Chaldean adults in Michigan to learn about their health status and behaviors (Arab Behavioral Risk Factor Survey, ABRFS).

Objectives

Following Andersen's behavioral model of predisposing, enabling, and need factors to predict utilization of health services, this paper compares access to health care between Arab/Chaldeans and White non-Hispanics in terms of having health insurance, reporting cost as a barrier to health care, having a personal provider and having an annual checkup.

Methods

The stand-alone telephone survey targeted 400 non-institutionalized Michigan adults of Arabic or Chaldean background. This was then combined with the Statewide Michigan BRFS (MiBRFS), which included 136 Arab/Chaldeans. The combined data set (n=12,938) had a total of 536 Arab Chaldeans.

Results

Arab/Chaldean adults differ from White non-Hispanic adults on being younger, between 18-44 years and having household incomes less than $20,000 and were slightly less likely to report being in excellent or very good health. They were more likely than White non-Hispanics to lack health insurance and more likely to claim that cost prevented seeking care. These differences disappear when controlling for a variety of demographic features such as age, marital status, household income, and employment status. But one finding that persisted was that Arab/Chaldeans are more likely than White non-Hispanics to have a personal health care provider.

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Conclusions

It is only after controlling for the demographic features that the disadvantages disappeared. We suspect that Arab/Chaldeans whose families migrated to the US in the first half of the twentieth century have acculturated over time while the more recent immigrants are still adjusting to their new life. Overall, this is probably the most rigorous survey of Arab/Chaldean health conducted to date – at least in Michigan and possibly in the nation. While not perfect, it did the job within budget constraints and this makes it a benchmark survey that may be replicated in the future.

Introduction

The World Health Organization (WHO) Regional Office for the Eastern Mediterranean has identified health systems strengthening as a strategic priority to move towards universal coverage (WHO, 2010). A subsequent committee report (WHO, 2013) noted that universal health coverage involves increasing the population covered, adding needed services, and reducing cost sharing and fees. The WHO report classified member countries in the Eastern Mediterranean Region into three groups based on each country's population health outcomes, health system performance and the level of health expenditure:

Group 1 in which all citizens are covered by government sponsored health insurance (includes Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates);

Group 2 in which a combination of government insurance for public sector employees, social health insurance for vulnerable populations and private health insurance schemes cover 40 to 90 percent of the population (includes Egypt, Islamic Republic of Iran, Iraq, Jordan, Lebanon, Libya, Morocco, occupied Palestinian territory, Syrian Arab Republic and Tunisia); and

Group 3 in which a combination of government insurance for public sector employees, social health insurance in certain geographic areas or labor sectors, private insurance for employees and community health insurance schemes cover around 26 percent of the population (includes Afghanistan, Djibouti, Pakistan, Somalia, South Sudan, Sudan and Yemen).

The United States currently has a combination of government health insurance for the elderly (Medicare) and the poor (Medicaid), private health insurance usually offered by employers or unions but also directly sold to individuals, and social health insurance (The Affordable Care Act, often referred to as Obamacare) for those ineligible for or unable to afford other plans. The National Health Interview Survey (Martinez, and Cohen, 2014) found that in the first six months of 2014 an estimated 87.8 percent of persons of all ages had some form of health insurance, although somewhat less (82.7%) were covered for the entire year prior to the telephone survey. The survey also found that for adults aged 18-64 health insurance ranged by race/ethnicity from 88.1% for whites, to 82.0% for Blacks and 65.5% for Hispanics. This would place the US near the top of the WHO Eastern Mediterranean Group 2.

Numerous reports and studies on the importance and role of health insurance on access to care in the US confirm that racial and ethnic minorities and people with low socioeconomic status are more likely to have problems accessing health care (AHRQ, 2014:233-245; Lille-Blanton and Hoffman, 2005). Although a distinct ethnic cultural minority, Arab/Chaldeans are classified by the US census as white, and therefore are generally not included in federal and state reports on minority health.

According to the Arab American Institute (2011) Michigan with between 200,000 and 500,000 Arab Americans ranks second behind California. Early immigrants came from Lebanon, Iraq and Syria, while since 1990 more are from Jordan and Egypt. About 80 % of the state's Arab American population resides in the Detroit metropolitan area and roughly one third of the city of Dearborn claims some Arab heritage.

Data on the Arab/Chaldean population in the US are difficult to obtain since the US Census classifies them as White non-Hispanic. In 1994, the Wayne County Michigan Department of Public Health and Michigan State University conducted what may be the first Behavioral Risk Factor Survey of Arab/Chaldeans in both English and Arabic. The survey was random digit dial within geographic strata in Wayne County. Interviews were conducted with 388 Arab Americans, 352 African Americans, and 800 of the remaining population (Hembroff, 2014).

In 2001, the Michigan Department of Community Health (MDCH), Division of Family and Community Health with the cooperation of Arab Community Center for Economic and Social Services (ACCESS) in Dearborn, MI designed a health survey which was translated into Arabic and administered to a convenience sample of approximately 1,000 people at 34 different community centers across Michigan (Aswad and Hammad, 2001).

The MDCH, Health Disparities Reduction and Minority Health Section (HDRMHS) was established in 1988 as the Office of Minority Health. Its work focuses on reducing health disparities among five racial, ethnic and tribal population groups in Michigan: African American, American Indian/Alaskan Native, Asian American/Pacific Islander, Hispanic/Latino, and Arab/Chaldean. One of the priorities for the HDRMHS is to improve race/ethnicity data collection among these racial/ethnic populations. As a result, HDRMHS has funded statewide, stand-alone, Behavioral Risk Factor Surveys (BRFS) for specific racial and ethnic minorities not adequately represented in the annual Michigan BRFS.

In 2013, a collaborative effort involving the HDRMHS, ACCESS, Michigan State University, Wayne State University Medical School, and Saginaw Valley State University enabled Michigan to become the first state to conduct a special Behavioral Risk Factor Survey (BRFS) with a probability sample of Arab/Chaldean American adults. This is one of a series of reports combining the statewide Behavioral Risk Factor Survey (MiBRFS) with a stand-alone survey of Arab/Chaldean adults in Michigan.

Objectives

Andersen's (1995) Behavioral Model of Health Services Use takes into account three factors that determine an individual's use of health care services: (1) predisposing demographic factors such as age, gender, education attainment and ethnicity, (2) enabling factors such as health insurance, household income and an available source of care, and (3) illness or need factors such as health status. We propose that this model can guide an exploration of health disparities for racial/ethnic groups and identify barriers to utilization. Therefore, we hypothesize that controlling for predisposing and enabling variables (e.g. .age, gender, education attainment, household income), Arab /Chaldean adults living in Michigan are less likely than White non-Hispanic adults to have health insurance, a personal doctor or health care provider, and an annual checkup, but are more likely to report that costs are a barrier to seeking health care.

Methods

The Behavioral Risk Factor Surveillance System (BRFSS) is a standardized health survey system developed by the US Centers for Disease Control and Prevention (CDC) which is administered yearly in each state to collect data on preventive health practices and risk behaviors. States may add questions to their behavioral risk factor surveys (BRFS) as well as conduct stand-alone surveys of specific populations.

Because Arab/Chaldeans compose between one and a half to five percent of the Michigan population, the MiBRFS would contain too few respondents for a meaningful analysis of the group. Since the CDC BRFSS protocol does not allow for an oversample of minority populations in a cost effective manner, we decided to conduct a stand-alone survey while following the CDC BRFSS protocol as much as possible. In order to be cost effective, a screening question, "are you of Arab or Chaldean origin?" was asked. If the respondent answered yes, they were then asked to participate in the Arab/Chaldean Behavioral Risk Factor Survey (ABRFS). In addition to the core MiBRFS questions, the ABRFS asked respondents about country of origin/ancestry, years lived in US, religious affiliation, and language spoken in the home.

The survey target for the ABRFS was 400 interviews with non-institutionalized Michigan adults of Arabic or Chaldean background. Since sampling companies have not developed surname targeted databases for Arab/Chaldeans, the Institute for Public Policy and Social Research at Michigan State University used a surname database developed by Kendra Schwartz of Wayne State University to identify surnames of individuals who were entered in various public records and organizational directories as Arab or Chaldean or whose birthplace or ancestry was from one of the 22 countries in the Arab League (Schwartz, et al, 2013). It then divided all census tracts in Michigan into three strata depending on whether it had at least ten percent Arab/Chaldean ancestry, four to ten percent, or less than four percent. Telephone numbers were randomly selected on a roughly proportional basis with the low density stratum being sampled at a lower rate. Only the landline listed samples were screened against the surname database before calling. For the ABRFS (but not MiBRFS), a cadre of bilingual (Arabic and English) interviewers were provided cultural training. Of the 400 interviews completed in the ABRFS, half (202) were conducted in Arabic.

The Arab/Chaldean BRFS (ABRFS) was conducted from May 23 - Sept 30, 2013 with 400 completed interviews (387 landlines, 13 cell phones) and the Michigan BRFS (MiBRFS) from Jan 1 2013 - Jan 30, 2014, with 12,438 completed interviews of which 136 self identified as Arab/Chaldean (76 landlines, 60 cell phones). The Council of American Survey Research Organizations (CASRO) completion rates ranged from 31.9 percent to 48.2 percent and the refusal rates from 11.5 percent to 20.2 percent. The 136 Arab/Chaldean respondents in the MiBRFS were then added to the 400 in the ABRFS for a total of 536 cases.

Measures

In general, people having health insurance and a personal doctor or health care provider and receiving annual medical checkups are considered to have access to care. The ABRFS was conducted in 2013 and the MiBRFS completed all but a few interviews before January 1, 2014, when the individual mandate which required most Americans to purchase health insurance or else pay a penalty went into effect.

The measure of having health insurance was a yes to the question: “Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service?” Respondents were asked three questions related to access to care: Was there a time in the past 12 months when you needed to see a doctor but could not because of cost? Do you have one person you think of as your personal doctor or health care provider? About how long has it been since you last visited a doctor for a routine checkup?

Procedure

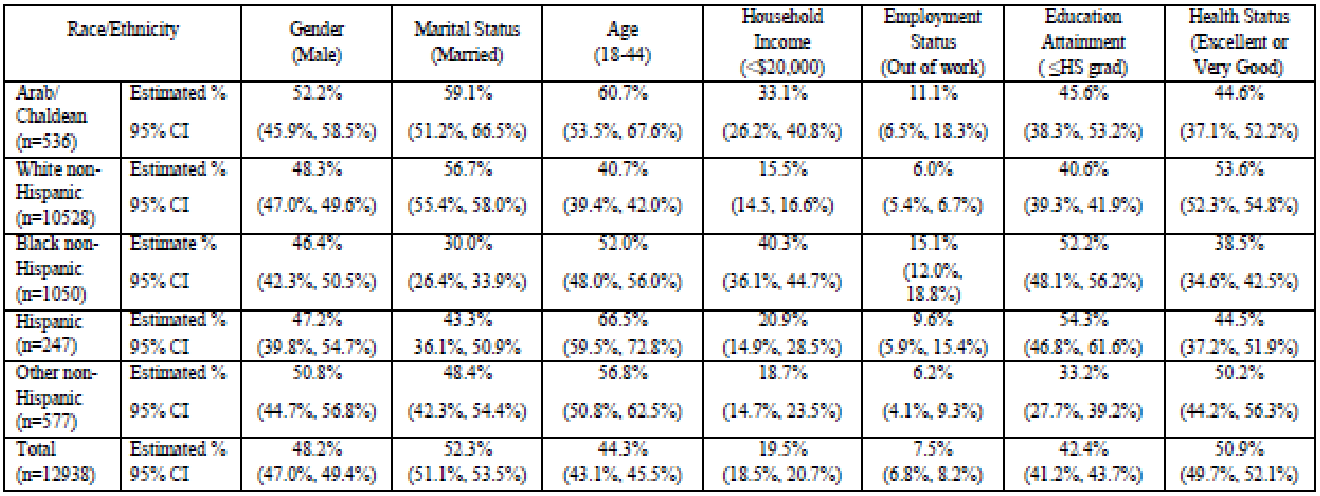
Before beginning the analysis the data were weighted to account for non-coverage, unequal probabilities of being selected for interviewing (including differential sampling rates between landline and cell phone numbers), differential non-response, and to match the Census Bureau profile of Michigan’s adult Arab population regarding gender, age, education attainment, marital status, and home ownership. Given this complex sample design, we used the SPSS Complex Sample module featuring the Taylor series linearization methods to calculate standard errors and the degrees of freedom for Student’s t test statistics. We then conducted bivariate analyses (data not shown) and multivariate analyses including logistic regressions and odds ratios.

Results

Demographics and Dependent Variables by Race/Ethnicity

Race/ethnicity was self-reported with 400 adults self-identifying as Arab/Chaldean for the ABRFS and an additional 136 adults self-identifying as Arab/Chaldean on the MiBRFS for a total of 536 respondents. The n’s for the other racial/ethnic groups are as follows: 10,528 White non-Hispanics, 1,050 Black non-Hispanics, 247 Hispanics**,** and 577 Other non-Hispanics**,** for a total sample of 12,938 adult respondents.

Table 1: Basic Demographic Independent Variables by Race/Ethnicity



Race/Ethnicity		Gender (Male)	Marital Status (Married)	Age (18-44)	Household Income (<$20,000)	Employment Status (Out of work)	Education Attainment (≤HS grad)	Health Status (Excellent or Very Good)
Arab/ Chaldean (n=536)	Estimated %	52.2%	59.1%	60.7%	33.1%	11.1%	45.6%	44.6%
	95% CI	(45.9%, 58.5%)	(51.2%, 66.5%)	(53.5%, 67.6%)	(26.2%, 40.8%)	(6.5%, 18.3%)	(38.3%, 53.2%)	(37.1%, 52.2%)
White non-Hispanic (n=10528)	Estimated %	48.3%	56.7%	40.7%	15.5%	6.0%	40.6%	53.6%
	95% CI	(47.0%, 49.6%)	(55.4%, 58.0%)	(39.4%, 42.0%)	(14.5, 16.6%)	(5.4%, 6.7%)	(39.3%, 41.9%)	(52.3%, 54.8%)
Black non-Hispanic (n=1050)	Estimate %	46.4%	30.0%	52.0%	40.3%	15.1%	52.2%	38.5%
	95% CI	(42.3%, 50.5%)	(26.4%, 33.9%)	(48.0%, 56.0%)	(36.1%, 44.7%)	(12.0%, 18.8%)	(48.1%, 56.2%)	(34.6%, 42.5%)
Hispanic (n=247)	Estimated %	47.2%	43.3%	66.5%	20.9%	9.6%	54.3%	44.5%
	95% CI	(39.8%, 54.7%)	36.1%, 50.9%	(59.5%, 72.8%)	(14.9%, 28.5%)	(5.9%, 15.4%)	(46.8%, 61.6%)	(37.2%, 51.9%)
Other non-Hispanic (n=577)	Estimated %	50.8%	48.4%	56.8%	18.7%	6.2%	33.2%	50.2%
	95% CI	(44.7%, 56.8%)	(42.3%, 54.4%)	(50.8%, 62.5%)	(14.7%, 23.5%)	(4.1%, 9.3%)	(27.7%, 39.2%)	(44.2%, 56.3%)
Total (n=12938)	Estimated %	48.2%	52.3%	44.3%	19.5%	7.5%	42.4%	50.9%
	95% CI	(47.0%, 49.4%)	(51.1%, 53.5%)	(43.1%, 45.5%)	(18.5%, 20.7%)	(6.8%, 8.2%)	(41.2%, 43.7%)	(49.7%, 52.1%)

Table 1 reveals that Arab/Chaldean adults differ from White non-Hispanic adults on being younger, between 18-44 years (60.7% v 40.7%), and having household incomes less than $20,000 (33.1% v 15.5%), but do not differ from Black non-Hispanic and Hispanic adults on age and household income. In addition, Arab/Chaldeans may be slightly less likely to report being in excellent or very good health compared with White non-Hispanics (44.6% v. 53.6%), but they do not differ on this from Black non-Hispanics and Hispanics.

The four dependent variables are health insurance, cost prevented care, not having a primary health care provider, and not having a routine checkup within the past year. Judging from the confidence intervals in Table 2, Arab Chaldeans differed from White non-Hispanics on lacking insurance (23.2% v 11.9%) and claiming cost prevented seeking care (25.3% v 13.7%), but they did not differ from Black non-Hispanics and Hispanics on these variables. Note that these data were collected in 2013 before the health insurance exchanges opened in early 2014.

Table 2: Dependent Variables by Race/Ethnicity

Race/Ethnic Group		Have Insurance No	Cost Prevented Care Yes	Personal Provider No	Checkup in Past Year No
Arab/ Chaldean (n=536)	Estimated %	23.2%	25.3%	17.5%	33.2%
	95% CI	(17.7%, 29.7%)	(19.7%, 31.9%)	(12.9%, 23.2%)	(25.9%, 41.6%)
White non-Hispanic (n=10,528)	Estimated %	11.9%	13.7%	14.8%	30.4%
	95% CI	(11.0%, 12.9%)	(12.7%, 14.7%)	(13.8%, 15.8%)	(29.2%, 31.7%)
Black non-Hispanic n=1,050)	Estimated %	22.7%	22.5%	23.2%	22.7%
	95% CI	(19.3%, 26.6%)	(19.1%, 26.2%)	(19.7%, 27.1%)	(19.5%, 26.2%)
Hispanic (n=247)	Estimated %	22.0%	23.2%)	22.6%	36.9%
	95% CI	(16.2%, 29.3%)	(17.2%, 30.4%)	(16.9%, 29.5%)	(30.1%, 44.3%)
Other non-Hispanic (n=577)	Estimated %	15.7%)	15.7%	26.3%	40.4%
	95% CI	(11.7%, 20.7%)	(11.9%, 20.4%)	(21.0%, 32.4%)	(34.5%, 46.7%)
Total (n=12,938)	Estimated %	14.1%	15.5%	16.8%	30.1%
	95% CI	(13.2%, 15.1%)	(14.6%, 16.5%)	(15.8%, 17.8%)	(29.0%, 31.3%)

Multivariate Analyses

The multivariate tests of model effects (Table 3) found that gender, age and household income significantly predicted all four dependent variables. Employment status predicted health insurance, personal provider and annual checkup, but not cost prevented care. Marital status predicted insurance and personal provider while race predicted only having an annual checkup. Health status predicted only cost prevented care and education attainment predicted only health insurance. Having health insurance predicted the other three dependent variables: cost prevented care, having a personal provider, and having an annual checkup.

Previous studies of health disparities in health insurance and access to care for racial/ethnic minorities control for covariates including gender, age, education attainment, marital status, employment status, education attainment, household income and health status (Wang et al, 2013; Mahmoudi and Jensen, 2012; and Zuvekas and Taliaferro, 2003). Given the overall similarity between Arab/Chaldean, Black non-Hispanic, and Hispanic adults in terms of the dependent variables, the remainder of this analysis will compare Arab/Chaldean adults to White non-Hispanic adults in an attempt to determine the extent to which Arab/Chaldean adults are disadvantaged compared to White non-Hispanic adults after controlling for covariates.

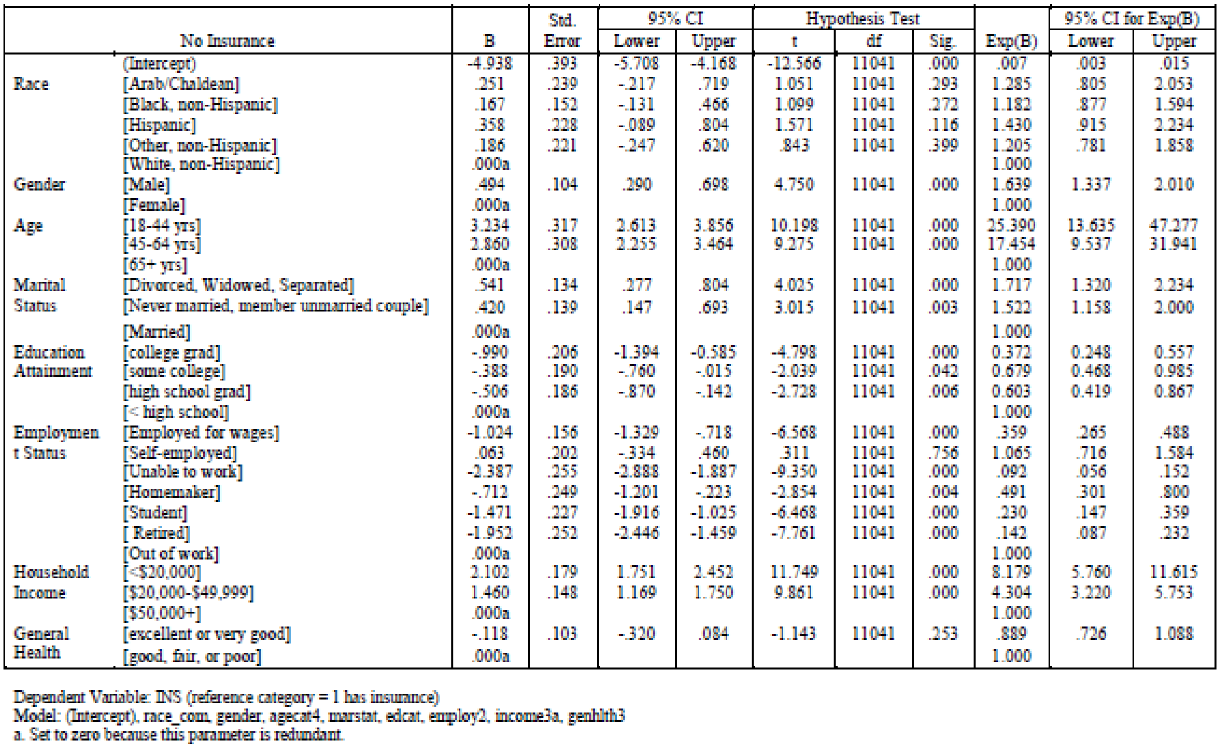
Table 3: Multiple Regression Tests of Model Effects by Dependent Variable

	Health Insurance No		Cost Prevent Care Yes		Personal Provider No		Checkup Last Year No	
	Wald F	Sig.	Wald F	Sig.	Wald F	Sig.	Wald F	Sig.
Corrected model	33.374	0.000	36.277	0.000	35.667	0.000	26.077	0.000
(intercept)	378.145	0.000	242.871	0.000	223.967	0.000	69.857	0.000
Race	1.131	0.340	0.353	0.842	2.037	0.086	8.673	0.000
Gender	22.566	0.000	9.305	0.002	68.139	0.000	25.034	0.000
Age	52.242	0.000	13.911	0.000	51.950	0.000	36.425	0.000
Marital Status	9.187	0.000	1.308	0.270	10.999	0.000	0.996	0.369
Education attainment	10.040	0.000	1.843	0.137	0.835	0.475	0.500	0.682
Employment Status	29.469	0.000	2.001	0.062	5.644	0.000	8.083	0.000
Household Income	70.724	0.000	53.062	0.000	15.249	0.000	12.747	0.000
Health Status	1.307	0.253	77.984	0.000	1.365	0.243	0.606	0.436
Insurance	-	-	188.991	0.000	162.706	0.000	128.517	0.000

Table 4 indicates that, after controlling for covariates, Arab/Chaldean adults are not significantly different from White non-Hispanic adults in terms of lacking health insurance (p=.293; and odds ratio 95% confidence interval crosses 1.000). Men were 1.6 times more likely than females to lack health insurance, and young people under 45 years of age were more likely not to have health insurance than those between 45 and 64 and those over 65. Divorced, widowed, separated and unmarried respondents were more likely to lack health insurance than married couples, as were those with less than a high school degree.

In terms of employment status, those who were out of work were more likely to lack health insurance than respondents employed for wages, homemakers, students, retirees and those unable to work. The lower the household income, the more likely respondents were to lack health insurance.

Table 4 Parameter Estimates for Having No Health Insurance

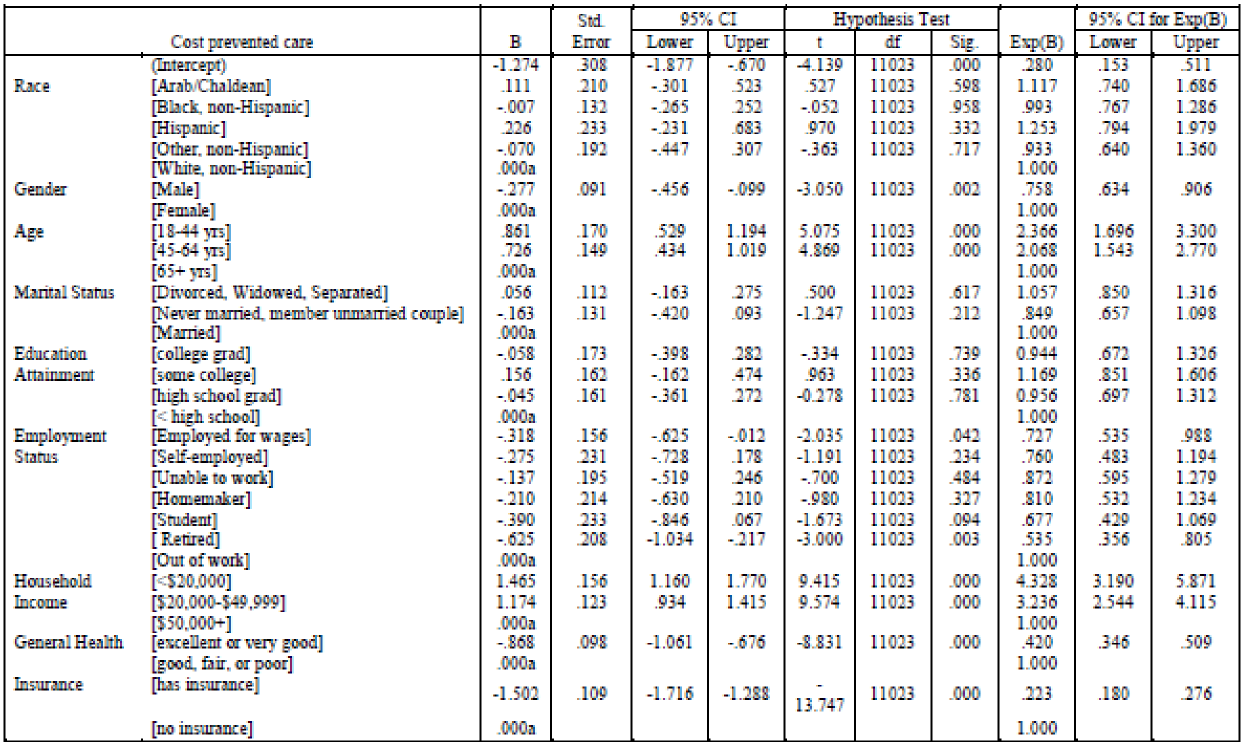


No Insurance		B	Std. Error	95% CI		Hypothesis Test			Exp(B)	95% CI for Exp(B)	
				Lower	Upper	t	df	Sig.		Lower	Upper
	(Intercept)	-4.938	.393	-5.708	-4.168	-12.566	11041	.000	.007	.003	.015
Race	[Arab/Chaldean]	.251	.239	-.217	.719	1.051	11041	.293	1.285	.805	2.053
	[Black, non-Hispanic]	.167	.152	-.131	.466	1.099	11041	.272	1.182	.877	1.594
	[Hispanic]	.358	.228	-.089	.804	1.571	11041	.116	1.430	.915	2.234
	[Other, non-Hispanic]	.186	.221	-.247	.620	.843	11041	.399	1.205	.781	1.858
	[White, non-Hispanic]	.000a							1.000		
Gender	[Male]	.494	.104	.290	.698	4.750	11041	.000	1.639	1.337	2.010
	[Female]	.000a							1.000		
Age	[18-44 yrs]	3.234	.317	2.613	3.856	10.198	11041	.000	25.390	13.635	47.277
	[45-64 yrs]	2.860	.308	2.255	3.464	9.275	11041	.000	17.454	9.537	31.941
	[65+ yrs]	.000a							1.000		
Marital Status	[Divorced, Widowed, Separated]	.541	.134	.277	.804	4.025	11041	.000	1.717	1.320	2.234
	[Never married, member unmarried couple]	.420	.139	.147	.693	3.015	11041	.003	1.522	1.158	2.000
	[Married]	.000a							1.000		
Education Attainment	[college grad]	-.990	.206	-1.394	-0.585	-4.798	11041	.000	0.372	0.248	0.557
	[some college]	-.388	.190	-.760	-.015	-2.039	11041	.042	0.679	0.468	0.985
	[high school grad]	-.506	.186	-.870	-.142	-2.728	11041	.006	0.603	0.419	0.867
	[< high school]	.000a							1.000		
Employment Status	[Employed for wages]	-1.024	.156	-1.329	-.718	-6.568	11041	.000	.359	.265	.488
	[Self-employed]	.063	.202	-.334	.460	.311	11041	.756	1.065	.716	1.584
	[Unable to work]	-2.387	.255	-2.888	-1.887	-9.350	11041	.000	.092	.056	.152
	[Homemaker]	-.712	.249	-1.201	-.223	-2.854	11041	.004	.491	.301	.800
	[Student]	-1.471	.227	-1.916	-1.025	-6.468	11041	.000	.230	.147	.359
	[Retired]	-1.952	.252	-2.446	-1.459	-7.761	11041	.000	.142	.087	.232
	[Out of work]	.000a							1.000		
Household Income	[<$20,000]	2.102	.179	1.751	2.452	11.749	11041	.000	8.179	5.760	11.615
	[$20,000-$49,999]	1.460	.148	1.169	1.750	9.861	11041	.000	4.304	3.220	5.753
	[$50,000+]	.000a							1.000		
General Health	[excellent or very good]	-.118	.103	-.320	.084	-1.143	11041	.253	.889	.726	1.088
	[good, fair, or poor]	.000a							1.000		

Dependent Variable: INS (reference category = 1 has insurance)
Model: (Intercept), race_com, gender, agecat4, marstat, edcat, employ2, income3a, genhlth3
a. Set to zero because this parameter is redundant.

After controlling for the covariates, Table 5 displays no significant difference between Arab/Chaldean adults and White non-Hispanic adults on reporting cost prevented seeking health care (p=.598; and odds ratio 95% confidence interval crosses 1.000). Females were more likely than males to report cost prevented seeking health care. Not surprisingly, people under 65 years of age, those with household incomes under $50,000, and those lacking health insurance were more likely to report cost as a barrier. In terms of employment status, the retired and those employed for wages were significantly less likely to report cost as a barrier to care. Those with good, fair or poor health status were also more likely to say costs prevented care. Finally marital status and education attainment did not predict cost as a barrier.

Table 5 Parameter Estimates for Cost Prevented Care



Cost prevented care		B	Std. Error	95% CI		Hypothesis Test			Exp(B)	95% CI for Exp(B)	
				Lower	Upper	t	df	Sig.		Lower	Upper
	(Intercept)	-1.274	.308	-1.877	-.670	-4.139	11023	.000	.280	.153	.511
Race	[Arab/Chaldean]	.111	.210	-.301	.523	.527	11023	.598	1.117	.740	1.686
	[Black, non-Hispanic]	-.007	.132	-.265	.252	-.052	11023	.958	.993	.767	1.286
	[Hispanic]	.226	.233	-.231	.683	.970	11023	.332	1.253	.794	1.979
	[Other, non-Hispanic]	-.070	.192	-.447	.307	-.363	11023	.717	.933	.640	1.360
	[White, non-Hispanic]	.000a							1.000		
Gender	[Male]	-.277	.091	-.456	-.099	-3.050	11023	.002	.758	.634	.906
	[Female]	.000a							1.000		
Age	[18-44 yrs]	.861	.170	.529	1.194	5.075	11023	.000	2.366	1.696	3.300
	[45-64 yrs]	.726	.149	.434	1.019	4.869	11023	.000	2.068	1.543	2.770
	[65+ yrs]	.000a							1.000		
Marital Status	[Divorced, Widowed, Separated]	.056	.112	-.163	.275	.500	11023	.617	1.057	.850	1.316
	[Never married, member unmarried couple]	-.163	.131	-.420	.093	-1.247	11023	.212	.849	.657	1.098
	[Married]	.000a							1.000		
Education Attainment	[college grad]	-.058	.173	-.398	.282	-.334	11023	.739	0.944	.672	1.326
	[some college]	.156	.162	-.162	.474	.963	11023	.336	1.169	.851	1.606
	[high school grad]	-.045	.161	-.361	.272	-0.278	11023	.781	0.956	.697	1.312
	[< high school]	.000a							1.000		
Employment Status	[Employed for wages]	-.318	.156	-.625	-.012	-2.035	11023	.042	.727	.535	.988
	[Self-employed]	-.275	.231	-.728	.178	-1.191	11023	.234	.760	.483	1.194
	[Unable to work]	-.137	.195	-.519	.246	-.700	11023	.484	.872	.595	1.279
	[Homemaker]	-.210	.214	-.630	.210	-.980	11023	.327	.810	.532	1.234
	[Student]	-.390	.233	-.846	.067	-1.673	11023	.094	.677	.429	1.069
	[Retired]	-.625	.208	-1.034	-.217	-3.000	11023	.003	.535	.356	.805
	[Out of work]	.000a							1.000		
Household Income	[<$20,000]	1.465	.156	1.160	1.770	9.415	11023	.000	4.328	3.190	5.871
	[$20,000-$49,999]	1.174	.123	.934	1.415	9.574	11023	.000	3.236	2.544	4.115
	[$50,000+]	.000a							1.000		
General Health	[excellent or very good]	-.868	.098	-1.061	-.676	-8.831	11023	.000	.420	.346	.509
	[good, fair, or poor]	.000a							1.000		
Insurance	[has insurance]	-1.502	.109	-1.716	-1.288	-13.747	11023	.000	.223	.180	.276
	[no insurance]	.000a							1.000		

Dependent Variable: costprev (reference category = 2 not without care)

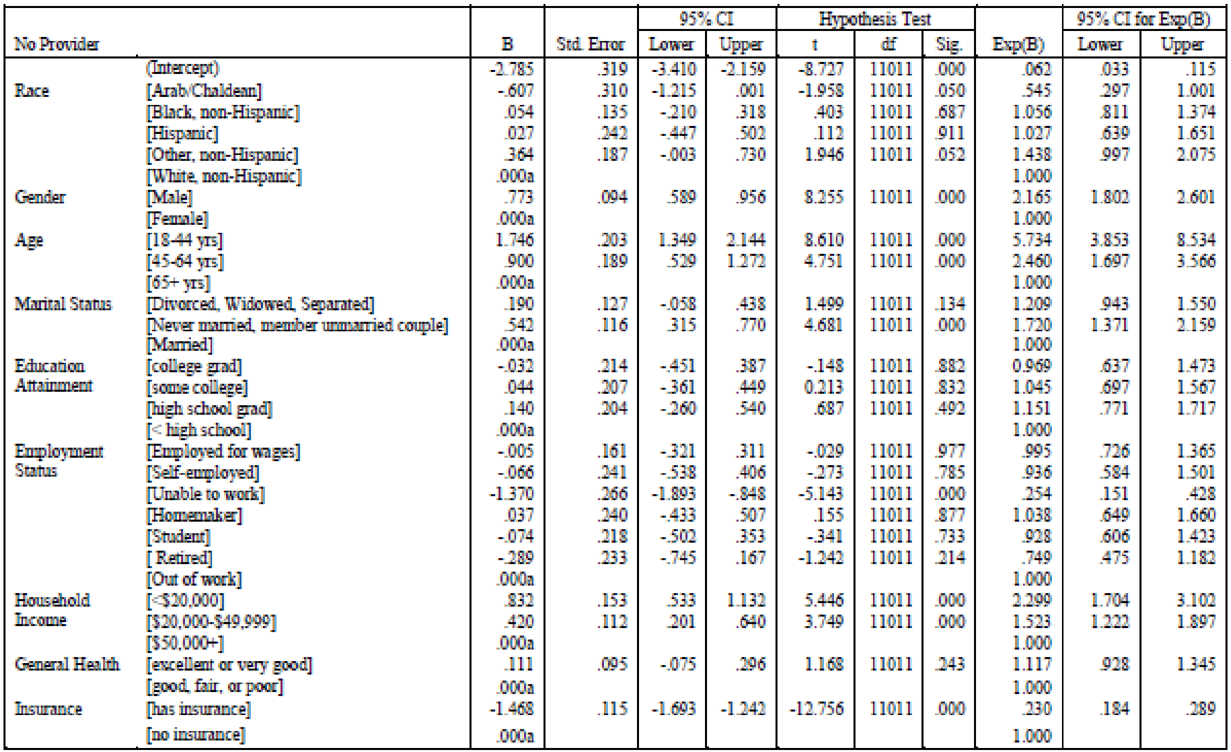
Model: (Intercept), race_com, gender, agecat4, marstat, edcat, employ2, income3a, genhlth3, INS

a. Set to zero because this parameter is redundant.

After controlling for covariates, Table 6 reveals that Arab/Chaldean adults were marginally less likely than White non-Hispanic adults to report having no personal doctor or health care provider (p=.050), reporting no personal provider about half as often (OR=.545) as White non-Hispanics. Males were more likely than females to report not having a personal provider. Young people under 45 years of age were more likely not to have a personal provider than those 45 to 64 who were more likely to have no personal provider than those 65 or older. Unmarried respondents were more likely than married respondents to have no personal provider. Those unable to work were least likely to report not having a personal provider, probably because they were receiving workmen's compensation that included health benefits and a presumed personal provider. Again, the lower the household income, the more likely a person was not to have a personal provider, as were people without health insurance. Education attainment and health status were not significant predictors of not having a personal provider.

This finding suggests that Arab/Chaldean adults are marginally more likely to have a personal doctor or health care provider than White non-Hispanic adults despite a lack of insurance and household income. We note that the questions on the Michigan BRFS and the Arab BRFS asked “Do you have one person you think of as your personal doctor or health care provider?” The ABRFS also asked “Where do you go most of the time for health care?” with 75% of the ABRFS respondents saying a private medical practice or doctor's office, 6.1% an ACCESS clinic, and 12.8% another health center/clinic. Surprisingly Arab/Chaldean adults are more likely to have a personal doctor or health care provider than White non-Hispanic adults.

Table 6 Parameter Estimates for Having No Provider

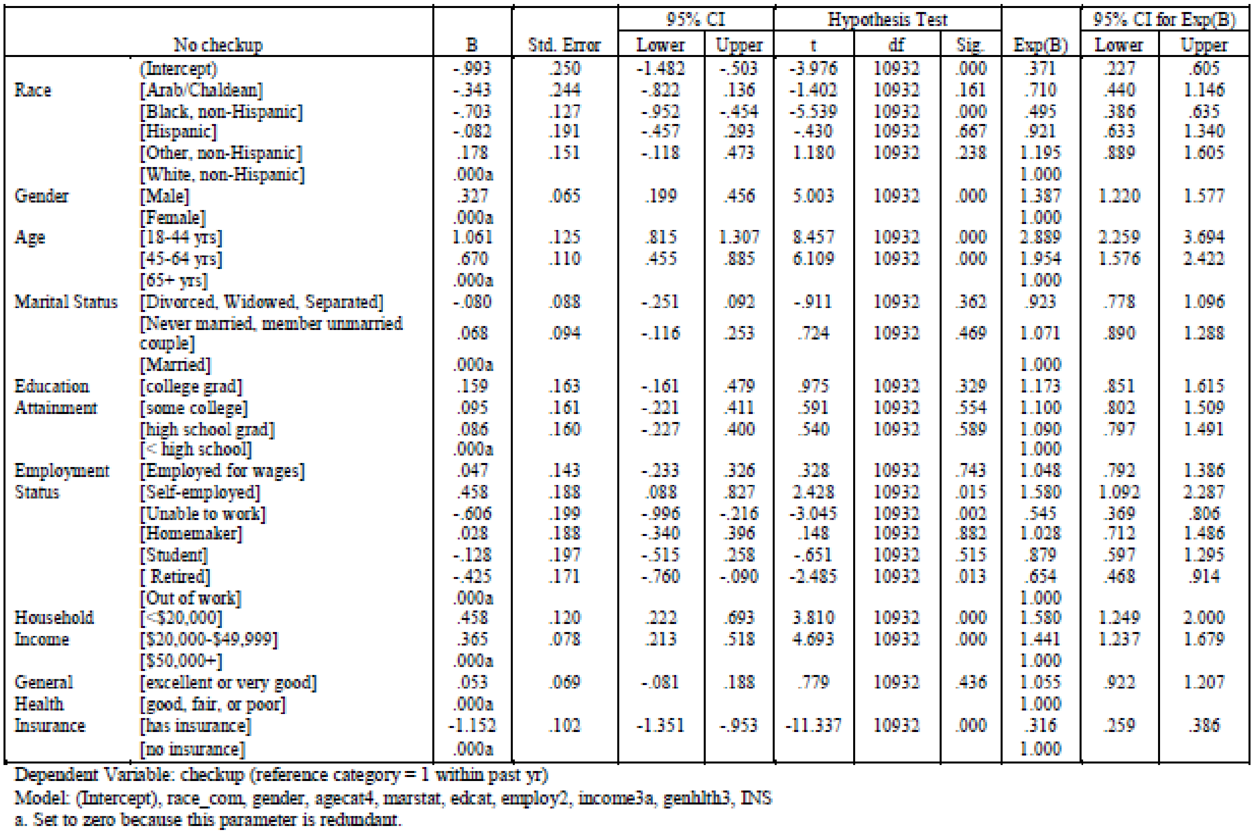


No Provider		B	Std. Error	95% CI		Hypothesis Test			Exp(B)	95% CI for Exp(B)	
				Lower	Upper	t	df	Sig.		Lower	Upper
	(Intercept)	-2.785	.319	-3.410	-2.159	-8.727	11011	.000	.062	.033	.115
Race	[Arab/Chaldean]	-.607	.310	-1.215	.001	-1.958	11011	.050	.545	.297	1.001
	[Black, non-Hispanic]	.054	.135	-.210	.318	.403	11011	.687	1.056	.811	1.374
	[Hispanic]	.027	.242	-.447	.502	.112	11011	.911	1.027	.639	1.651
	[Other, non-Hispanic]	.364	.187	-.003	.730	1.946	11011	.052	1.438	.997	2.075
	[White, non-Hispanic]	.000a							1.000		
Gender	[Male]	.773	.094	.589	.956	8.255	11011	.000	2.165	1.802	2.601
	[Female]	.000a							1.000		
Age	[18-44 yrs]	1.746	.203	1.349	2.144	8.610	11011	.000	5.734	3.853	8.534
	[45-64 yrs]	.900	.189	.529	1.272	4.751	11011	.000	2.460	1.697	3.566
	[65+ yrs]	.000a							1.000		
Marital Status	[Divorced, Widowed, Separated]	.190	.127	-.058	.438	1.499	11011	.134	1.209	.943	1.550
	[Never married, member unmarried couple]	.542	.116	.315	.770	4.681	11011	.000	1.720	1.371	2.159
	[Married]	.000a							1.000		
Education Attainment	[college grad]	-.032	.214	-.451	.387	-.148	11011	.882	0.969	.637	1.473
	[some college]	.044	.207	-.361	.449	0.213	11011	.832	1.045	.697	1.567
	[high school grad]	.140	.204	-.260	.540	.687	11011	.492	1.151	.771	1.717
	[< high school]	.000a							1.000		
Employment Status	[Employed for wages]	-.005	.161	-.321	.311	-.029	11011	.977	.995	.726	1.365
	[Self-employed]	-.066	.241	-.538	.406	-.273	11011	.785	.936	.584	1.501
	[Unable to work]	-1.370	.266	-1.893	-.848	-5.143	11011	.000	.254	.151	.428
	[Homemaker]	.037	.240	-.433	.507	.155	11011	.877	1.038	.649	1.660
	[Student]	-.074	.218	-.502	.353	-.341	11011	.733	.928	.606	1.423
	[Retired]	-.289	.233	-.745	.167	-1.242	11011	.214	.749	.475	1.182
	[Out of work]	.000a							1.000		
Household Income	[<$20,000]	.832	.153	.533	1.132	5.446	11011	.000	2.299	1.704	3.102
	[$20,000-$49,999]	.420	.112	.201	.640	3.749	11011	.000	1.523	1.222	1.897
	[$50,000+]	.000a							1.000		
General Health	[excellent or very good]	.111	.095	-.075	.296	1.168	11011	.243	1.117	.928	1.345
	[good, fair, or poor]	.000a							1.000		
Insurance	[has insurance]	-1.468	.115	-1.693	-1.242	-12.756	11011	.000	.230	.184	.289
	[no insurance]	.000a							1.000		

Dependent Variable: PROVIDER (reference category = 1 >=1 provider)
Model: (Intercept), race_com, gender, agecat4, marstat, edcat, employ2, income3a, genhlth3, INS
a. Set to zero because this parameter is redundant.

After controlling for covariates, Table 7 displays no significant difference between Arab/Chaldean adults and White non-Hispanic adults for not having a checkup during the past year (p=.161; and odds ratio 95% confidence interval crosses 1.000). Of the covariates, marital status, education attainment, and general health status did not predict not having a checkup. Males were more likely than females not to have had an annual checkup in the past year as were younger respondents (18-65 years), those with lower household incomes (<$50,000) and respondents who lacked health insurance. In terms of employment status, the self employed were more likely to report no annual checkup while those unable to work and the retired were more likely to report an annual checkup.

Table 7 Parameter Estimates for no annual checkup



No checkup		B	Std. Error	95% CI		Hypothesis Test			Exp(B)	95% CI for Exp(B)	
				Lower	Upper	t	df	Sig.		Lower	Upper
	(Intercept)	-.993	.250	-1.482	-.503	-3.976	10932	.000	.371	.227	.605
Race	[Arab/Chaldean]	-.343	.244	-.822	.136	-1.402	10932	.161	.710	.440	1.146
	[Black, non-Hispanic]	-.703	.127	-.952	-.454	-5.539	10932	.000	.495	.386	.635
	[Hispanic]	-.082	.191	-.457	.293	-.430	10932	.667	.921	.633	1.340
	[Other, non-Hispanic]	.178	.151	-.118	.473	1.180	10932	.238	1.195	.889	1.605
	[White, non-Hispanic]	.000a							1.000		
Gender	[Male]	.327	.065	.199	.456	5.003	10932	.000	1.387	1.220	1.577
	[Female]	.000a							1.000		
Age	[18-44 yrs]	1.061	.125	.815	1.307	8.457	10932	.000	2.889	2.259	3.694
	[45-64 yrs]	.670	.110	.455	.885	6.109	10932	.000	1.954	1.576	2.422
	[65+ yrs]	.000a							1.000		
Marital Status	[Divorced, Widowed, Separated]	-.080	.088	-.251	.092	-.911	10932	.362	.923	.778	1.096
	[Never married, member unmarried couple]	.068	.094	-.116	.253	.724	10932	.469	1.071	.890	1.288
	[Married]	.000a							1.000		
Education Attainment	[college grad]	.159	.163	-.161	.479	.975	10932	.329	1.173	.851	1.615
	[some college]	.095	.161	-.221	.411	.591	10932	.554	1.100	.802	1.509
	[high school grad]	.086	.160	-.227	.400	.540	10932	.589	1.090	.797	1.491
	[< high school]	.000a							1.000		
Employment Status	[Employed for wages]	.047	.143	-.233	.326	.328	10932	.743	1.048	.792	1.386
	[Self-employed]	.458	.188	.088	.827	2.428	10932	.015	1.580	1.092	2.287
	[Unable to work]	-.606	.199	-.996	-.216	-3.045	10932	.002	.545	.369	.806
	[Homemaker]	.028	.188	-.340	.396	.148	10932	.882	1.028	.712	1.486
	[Student]	-.128	.197	-.515	.258	-.651	10932	.515	.879	.597	1.295
	[Retired]	-.425	.171	-.760	-.090	-2.485	10932	.013	.654	.468	.914
	[Out of work]	.000a							1.000		
Household Income	[<$20,000]	.458	.120	.222	.693	3.810	10932	.000	1.580	1.249	2.000
	[$20,000-$49,999]	.365	.078	.213	.518	4.693	10932	.000	1.441	1.237	1.679
	[$50,000+]	.000a							1.000		
General Health	[excellent or very good]	.053	.069	-.081	.188	.779	10932	.436	1.055	.922	1.207
	[good, fair, or poor]	.000a							1.000		
Insurance	[has insurance]	-1.152	.102	-1.351	-.953	-11.337	10932	.000	.316	.259	.386
	[no insurance]	.000a							1.000		

Dependent Variable: checkup (reference category = 1 within past yr)
Model: (Intercept), race_com, gender, agecat4, marstat, edcat, employ2, income3a, genhlth3, INS
a. Set to zero because this parameter is redundant.

Discussion

Demographically, Arab/Chaldean respondents do not resemble White non-Hispanics, a group which, until recently, has included them. Like other minority ethnic groups they are younger, have lower household incomes, are more likely to be out of work and are less likely to report being in excellent or good health than the White non-Hispanic population. They also tend to lack health insurance, report cost as a factor preventing access to health care, and not receive an annual checkup. However, Arab/Chaldeans are more likely than White non-Hispanics to have a personal health care provider.

What does 'having a personal provider' mean? It suggests that respondents can name a private physician, doctor's office, or health clinic where they can get care and who will see them as a patient. Perhaps Arab/Chaldeans know of an Arab/Chaldean physician in their community, but are hesitant to seek care or have an annual checkup if they lack insurance or the money to pay for the visit out of pocket. One explanation may be that the household income distribution for Arab/Chaldean adults is flat with about a third (33.1%) having household incomes under $20,000 , 35.2% between $20,000 and $49,999 and 31.7% over $50,000 compared with White non-Hispanics with 15.5% under $20,000, 36.4% in the middle income bracket and almost half (48.1%) with household incomes of $50,000 and over. In addition, more Arab/Chaldeans were out of work than White non-Hispanics (11.1% v 6.0%). So, while they may identify a personal doctor or health care provider, Arab/Chaldeans are less likely to have the means to access that care.

Another factor affecting utilization is that in more observant Muslim families, women may not be able to seek care without the permission of an adult male relative, may need to be accompanied to the physician's office by a male relative, and may want to be treated by a female physician or provider. This may depend on an acculturation process that reflects when the Arab/Chaldeans migrated to the US and whether they are Christians or Muslims.

Limitations

The Arab BRFS was administered in both English and Arabic, but given the recent immigrant status of some respondents and the wide variety of standard and colloquial Arabic dialects that differ by country, urban/rural settings and social class or prestige, some translation and speaking issues may exist. Both surveys asked the same questions on sexual orientation, sexual and physical abuse, and alcohol consumption, which are culturally sensitive in the Arab/Chaldean community. These data are self reported and we were unable to determine how comfortable the respondents were when answering questions about their personal health and behaviors. This is known as the social desirability bias since respondents tend to give what they perceive to be the socially appropriate answer.

The data set combined 400 adult respondents from the Arab/Chaldean Behavioral Risk Factor (ABRFS) survey with 136 self identified Arab/Chaldeans in the MiBRFS and over 10,000 White non-Hispanic adult respondents from the MiBRFS. The sampling methods were not identical, although both samples were randomly selected from their particular frames and respondents were randomly selected from among eligible respondents of selected household reached. Overall, this is probably the most rigorous survey of Arab/Chaldean health conducted to date – at least in Michigan and possibly in the nation. While not perfect, it did the job within budget constraints and this makes it a benchmark survey that may be replicated in the future.

Conclusion

The demographic cross tabulations suggest that Arab/Chaldean respondents more closely resemble Black non-Hispanic and Hispanics who are younger, have lower household incomes, more likely to be out of work and less likely to report being in excellent or good health than White non-Hispanics, the group in which Arab/Chaldeans are usually included for statistical purposes.

Like Black non-Hispanics and Hispanics, Arab/Chaldeans are more likely to lack health insurance and report cost as a factor preventing access to health care than White non-Hispanics. After controlling for several demographic variables, the multivariate logistic regression models show no difference between Arab/Chaldeans and White non-Hispanics on having insurance, reporting cost prevented care and having in annual checkup. They only differ from White non-Hispanics in having a personal health care provider. These findings suggest that it is not Arab/Chaldean status *per se*, but demographic factors such as gender, age, employment, and household income that account for most of the differences in health care access between Arab/Chaldeans and White non-Hispanics. A more detailed analysis needs to be done.

The initial cross tabulations suggest that Arab/Chaldeans are disadvantaged in terms of having health insurance and reporting that cost is a barrier to obtaining care. It is only after controlling for the demographic features that these disadvantages disappear. We suspect that Arab/Chaldeans whose families migrated to the US in the first half of the twentieth century have acculturated over time while the more recent immigrants are still adjusting to their new life.

Since the ABRFS had additional questions on ancestry, time in US, language in home and religion they were not included in the MiBRFS, an in depth analysis of just the 400 Arab/Chaldeans in the stand-alone survey may shed additional insight on how migration waves and generational differences affect the health and behaviors of Arab/Chaldeans.

Finally a subsequent BRFS conducted sometime after 2016 would enable us to measure changes in this population.

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Table 1: Basic Demographic Independent Variables by Race/Ethnicity

		Gender (Male)	**Marital Status (Married)**	**Age (18-44)**	**Household Income (<$20,000)**	**Employment Status (Out of work)**	**Education Attainment (High School graduate or less)**	**Health Status (Excellent or Very Good)**
Arab/Chaldean (n=536)	Estimate	52.2%	59.1%	60.7%	33.1%	11.1%	45.6%	44.6%
	95% Confidence Interval	(45.9%, 58.5%)	(51.2%, 66.5%)	(53.5%, 67.6%)	(26.2%, 40.8%)	(6.5%, 18.3%)	(38.3%, 53.2%)	(37.1%, 52.2%)
White non-Hispanic (n=10528)	Estimate	48.3%	56.7%	40.7%	15.5%	6.0%	40.6%	53.6%
	95% Confidence Interval	(47.0%, 49.6%)	(55.4%, 58.0%)	(39.4%, 42.0%)	(14.5, 16.6%)	(5.4%, 6.7%)	(39.3%, 41.9%)	(52.3%, 54.8%)
Black non-Hispanic (n=1050)	Estimate	46.4%	30.0%	52.0%	40.3%	15.1%	52.2%	38.5%
	95% Confidence Interval	(42.3%, 50.5%)	(26.4%, 33.9%)	(48.0%, 56.0%)	(36.1%, 44.7%)	(12.0%, 18.8%)	(48.1%, 56.2%)	(34.6%, 42.5%)
Hispanic (n=247)	Estimate	47.2%	43.3%	66.5%	20.9%	9.6%	54.3%	44.5%
	95% Confidence Interval	(39.8%, 54.7%)	36.1%, 50.9%	(59.5%, 72.8%)	(14.9%, 28.5%)	(5.9%, 15.4%)	(46.8%, 61.6%)	(37.2%, 51.9%)
Other non-Hispanic (n=577)	Estimate	50.8%	48.4%	56.8%	18.7%	6.2%	33.2%	50.2%
	95% Confidence Interval	(44.7%, 56.8%)	(42.3%, 54.4%)	(50.8%, 62.5%)	(14.7%, 23.5%)	(4.1%, 9.3%)	(27.7%, 39.2%)	(44.2%, 56.3%)
Total (n=12938)	Estimate	48.2%	52.3%	44.3%	19.5%	7.5%	42.4%	50.9%
	95% Confidence Interval	(47.0%, 49.4%)	(51.1%, 53.5%)	(43.1%, 45.5%)	(18.5%, 20.7%)	(6.8%, 8.2%)	(41.2%, 43.7%)	(49.7%, 52.1%)

Table 2: Dependent Variables by Race/Ethnicity

Race		Insurance No	Cost Prevented Care Yes	Personal Provider No	Checkup in Past Year No
Arab/Chaldean (n=536)	Estimate	23.2%	25.3%	17.5%	33.2%
	95% Confidence Interval	(17.7%, 29.7%)	(19.7%, 31.9%)	(12.9%, 23.2%)	(25.9%, 41.6%)
White non-Hispanic (n=10528)	Estimate	11.9%	13.7%	14.8%	30.4%
	95% Confidence Interval	(11.0%, 12.9%)	(12.7%, 14.7%)	(13.8%, 15.8%)	(29.2%, 31.7%)
Black non-Hispanic n=1050)	Estimate	22.7%	22.5%	23.2%	22.7%
	95% Confidence Interval	(19.3%, 26.6%)	(19.1%, 26.2%)	(19.7%, 27.1%)	(19.5%, 26.2%)
Hispanic (n=247)	Estimate	22.0%	23.2%)	22.6%	36.9%
	95% Confidence Interval	(16.2%, 29.3%)	(17.2%, 30.4%)	(16.9%, 29.5%)	(30.1%, 44.3%)
Other non-Hispanic (n=577)	Estimate	15.7%)	15.7%	26.3%	40.4%
	95% Confidence Interval	(11.7%, 20.7%)	(11.9%, 20.4%)	(21.0%, 32.4%)	(34.5%, 46.7%)
Total (n=12938)	Estimate	14.1%	15.5%	16.8%	30.1%
	95% Confidence Interval	(13.2%, 15.1%)	(14.6%, 16.5%)	(15.8%, 17.8%)	(29.0%, 31.3%)

Table 3: Multiple Regression Tests of Model Effects by Dependent Variable

	Health Insurance No		Cost Prevent Care Yes		Personal Provider No		Checkup Last Year No	
	Wald F	Sig.	Wald F	Sig.	Wald F	Sig.	Wald F	Sig.
Corrected model	33.374	0.000	36.277	0.000	35.667	0.000	26.077	0.000
(intercept)	378.145	0.000	242.871	0.000	223.967	0.000	69.857	0.000
Race	1.131	0.340	0.353	0.842	2.037	0.086	8.673	0.000
Gender	22.566	0.000	9.305	0.002	68.139	0.000	25.034	0.000
Age	52.242	0.000	13.911	0.000	51.950	0.000	36.425	0.000
Marital Status	9.187	0.000	1.308	0.270	10.999	0.000	0.996	0.369
Education attainment	10.040	0.000	1.843	0.137	0.835	0.475	0.500	0.682
Employ Status	29.469	0.000	2.001	0.062	5.644	0.000	8.083	0.000
Household Income	70.724	0.000	53.062	0.000	15.249	0.000	12.747	0.000
Health Status	1.307	0.253	77.984	0.000	1.365	0.243	0.606	0.436
Insurance	-	-	188.991	0.000	162.706	0.000	128.517	0.000

Table 4: Parameter Estimates for Having No Health Insurance

No Insurance		B	Std. Error	95% Confidence Interval		Hypothesis Test			Exp(B)	95% Confidence Interval for Exp(B)	
				Lower	Upper	t	df	Sig.		Lower	Upper
	(Intercept)	-4.938	.393	-5.708	-4.168	-12.566	11041	.000	.007	.003	.015
Race	[Arab/Chaldean]	.251	.239	-.217	.719	1.051	11041	.293	1.285	.805	2.053
	[Black, non-Hispanic]	.167	.152	-.131	.466	1.099	11041	.272	1.182	.877	1.594
	[Hispanic]	.358	.228	-.089	.804	1.571	11041	.116	1.430	.915	2.234
	[Other, non-Hispanic]	.186	.221	-.247	.620	.843	11041	.399	1.205	.781	1.858
	[White, non-Hispanic]	.000a							1.000		
Gender	[Male]	.494	.104	.290	.698	4.750	11041	.000	1.639	1.337	2.010
	[Female]	.000a							1.000		
Age	[18-44 yrs]	3.234	.317	2.613	3.856	10.198	11041	.000	25.390	13.635	47.277
	[45-64 yrs]	2.860	.308	2.255	3.464	9.275	11041	.000	17.454	9.537	31.941
	[65+ yrs]	.000a							1.000		
Marital Status	[Divorced, Widowed, Separated]	.541	.134	.277	.804	4.025	11041	.000	1.717	1.320	2.234
	[Never married, member unmarried couple]	.420	.139	.147	.693	3.015	11041	.003	1.522	1.158	2.000
	[Married]	.000a							1.000		
Education Attainment	[college grad]	-.990	.206	-1.394	-0.585	-4.798	11041	.000	0.372	0.248	0.557
	[some college]	-.388	.190	-.760	-.015	-2.039	11041	.042	0.679	0.468	0.985
	[high school grad]	-.506	.186	-.870	-.142	-2.728	11041	.006	0.603	0.419	0.867
	[< high school]	.000a							1.000		
Employment Status	[Employed for wages]	-1.024	.156	-1.329	-.718	-6.568	11041	.000	.359	.265	.488
	[Self-employed]	.063	.202	-.334	.460	.311	11041	.756	1.065	.716	1.584
	[Unable to work]	-2.387	.255	-2.888	-1.887	-9.350	11041	.000	.092	.056	.152
	[Homemaker]	-.712	.249	-1.201	-.223	-2.854	11041	.004	.491	.301	.800
	[Student]	-1.471	.227	-1.916	-1.025	-6.468	11041	.000	.230	.147	.359
	[Retired]	-1.952	.252	-2.446	-1.459	-7.761	11041	.000	.142	.087	.232
	[Out of work]	.000a							1.000		
Household Income	[<$20,000]	2.102	.179	1.751	2.452	11.749	11041	.000	8.179	5.760	11.615
	[$20,000-$49,999]	1.460	.148	1.169	1.750	9.861	11041	.000	4.304	3.220	5.753
	[$50,000+]	.000a							1.000		
General Health	[excellent or very good]	-.118	.103	-.320	.084	-1.143	11041	.253	.889	.726	1.088
	[good, fair, or poor]	.000a							1.000		

Dependent Variable: INS (reference category = 1 has insurance)
Model: (Intercept), race_com, gender, agecat4, marstat, edcat, employ2, income3a, genhlth3
a. Set to zero because this parameter is redundant.

Table 5 Parameter Estimates for Cost Prevented Care

costprev		B	Std. Error	95% Confidence Interval		Hypothesis Test			Exp(B)	95% Confidence Interval for Exp(B)	
				Lower	Upper	t	df	Sig.		Lower	Upper
	(Intercept)	-1.274	.308	-1.877	-.670	-4.139	11023	.000	.280	.153	.511
Race	[Arab/Chaldean]	.111	.210	-.301	.523	.527	11023	.598	1.117	.740	1.686
	[Black, non-Hispanic]	-.007	.132	-.265	.252	-.052	11023	.958	.993	.767	1.286
	[Hispanic]	.226	.233	-.231	.683	.970	11023	.332	1.253	.794	1.979
	[Other, non-Hispanic]	-.070	.192	-.447	.307	-.363	11023	.717	.933	.640	1.360
	[White, non-Hispanic]	.000a							1.000		
Gender	[Male]	-.277	.091	-.456	-.099	-3.050	11023	.002	.758	.634	.906
	[Female]	.000a							1.000		
Age	[18-44 yrs]	.861	.170	.529	1.194	5.075	11023	.000	2.366	1.696	3.300
	[45-64 yrs]	.726	.149	.434	1.019	4.869	11023	.000	2.068	1.543	2.770
	[65+ yrs]	.000a							1.000		
Marital Status	[Divorced, Widowed, Separated]	.056	.112	-.163	.275	.500	11023	.617	1.057	.850	1.316
	[Never married, member unmarried couple]	-.163	.131	-.420	.093	-1.247	11023	.212	.849	.657	1.098
	[Married]	.000a							1.000		
Education Attainment	[college grad]	-.058	.173	-.398	.282	-.334	11023	.739	0.944	.672	1.326
	[some college]	.156	.162	-.162	.474	.963	11023	.336	1.169	.851	1.606
	[high school grad]	-.045	.161	-.361	.272	-0.278	11023	.781	0.956	.697	1.312
	[< high school]	.000a							1.000		
Employment Status	[Employed for wages]	-.318	.156	-.625	-.012	-2.035	11023	.042	.727	.535	.988
	[Self-employed]	-.275	.231	-.728	.178	-1.191	11023	.234	.760	.483	1.194
	[Unable to work]	-.137	.195	-.519	.246	-.700	11023	.484	.872	.595	1.279
	[Homemaker]	-.210	.214	-.630	.210	-.980	11023	.327	.810	.532	1.234
	[Student]	-.390	.233	-.846	.067	-1.673	11023	.094	.677	.429	1.069
	[Retired]	-.625	.208	-1.034	-.217	-3.000	11023	.003	.535	.356	.805
	[Out of work]	.000a							1.000		
Household Income	[<$20,000]	1.465	.156	1.160	1.770	9.415	11023	.000	4.328	3.190	5.871
	[$20,000-$49,999]	1.174	.123	.934	1.415	9.574	11023	.000	3.236	2.544	4.115
	[$50,000+]	.000a							1.000		
General Health	[excellent or very good]	-.868	.098	-1.061	-.676	-8.831	11023	.000	.420	.346	.509
	[good, fair, or poor]	.000a							1.000		
Insurance	[has insurance]	-1.502	.109	-1.716	-1.288	-13.747	11023	.000	.223	.180	.276
	[no insurance]	.000a							1.000		

Dependent Variable: costprev (reference category = 2 not without care)
Model: (Intercept), race_com, gender, agecat4, marstat, edcat, employ2, income3a, genhlth3, INS
a. Set to zero because this parameter is redundant.

Table 6 Parameter Estimates for Having No Provider

				95% Confidence Interval		Hypothesis Test				95% Confidence Interval for Exp(B)	
No Provider		B	Std. Error	Lower	Upper	t	df	Sig.	Exp(B)	Lower	Upper
	(Intercept)	-2.785	.319	-3.410	-2.159	-8.727	11011	.000	.062	.033	.115
Race	[Arab/Chaldean]	-.607	.310	-1.215	.001	-1.958	11011	.050	.545	.297	1.001
	[Black, non-Hispanic]	.054	.135	-.210	.318	.403	11011	.687	1.056	.811	1.374
	[Hispanic]	.027	.242	-.447	.502	.112	11011	.911	1.027	.639	1.651
	[Other, non-Hispanic]	.364	.187	-.003	.730	1.946	11011	.052	1.438	.997	2.075
	[White, non-Hispanic]	.000a							1.000		
Gender	[Male]	.773	.094	.589	.956	8.255	11011	.000	2.165	1.802	2.601
	[Female]	.000a							1.000		
Age	[18-44 yrs]	1.746	.203	1.349	2.144	8.610	11011	.000	5.734	3.853	8.534
	[45-64 yrs]	.900	.189	.529	1.272	4.751	11011	.000	2.460	1.697	3.566
	[65+ yrs]	.000a							1.000		
Marital Status	[Divorced, Widowed, Separated]	.190	.127	-.058	.438	1.499	11011	.134	1.209	.943	1.550
	[Never married, member unmarried couple]	.542	.116	.315	.770	4.681	11011	.000	1.720	1.371	2.159
	[Married]	.000a							1.000		
Education Attainment	[college grad]	-.032	.214	-.451	.387	-.148	11011	.882	0.969	.637	1.473
	[some college]	.044	.207	-.361	.449	0.213	11011	.832	1.045	.697	1.567
	[high school grad]	.140	.204	-.260	.540	.687	11011	.492	1.151	.771	1.717
	[< high school]	.000a							1.000		
Employment Status	[Employed for wages]	-.005	.161	-.321	.311	-.029	11011	.977	.995	.726	1.365
	[Self-employed]	-.066	.241	-.538	.406	-.273	11011	.785	.936	.584	1.501
	[Unable to work]	-1.370	.266	-1.893	-.848	-5.143	11011	.000	.254	.151	.428
	[Homemaker]	.037	.240	-.433	.507	.155	11011	.877	1.038	.649	1.660
	[Student]	-.074	.218	-.502	.353	-.341	11011	.733	.928	.606	1.423
	[Retired]	-.289	.233	-.745	.167	-1.242	11011	.214	.749	.475	1.182
	[Out of work]	.000a							1.000		
Household Income	[<$20,000]	.832	.153	.533	1.132	5.446	11011	.000	2.299	1.704	3.102
	[$20,000-$49,999]	.420	.112	.201	.640	3.749	11011	.000	1.523	1.222	1.897
	[$50,000+]	.000a							1.000		
General Health	[excellent or very good]	.111	.095	-.075	.296	1.168	11011	.243	1.117	.928	1.345
	[good, fair, or poor]	.000a							1.000		
Insurance	[has insurance]	-1.468	.115	-1.693	-1.242	-12.756	11011	.000	.230	.184	.289
	[no insurance]	.000a							1.000		

Dependent Variable: PROVIDER (reference category = 1 >=1 provider)
Model: (Intercept), race_com, gender, agecat4, marstat, edcat, employ2, income3a, genhlth3, INS
a. Set to zero because this parameter is redundant.

Table 7 Parameter Estimates for no annual checkup

				95% Confidence Interval		Hypothesis Test				95% Confidence Interval for Exp(B)	
No checkup		B	Std. Error	Lower	Upper	t	df	Sig.	Exp(B)	Lower	Upper
	(Intercept)	-.993	.250	-1.482	-.503	-3.976	10932	.000	.371	.227	.605
Race	[Arab/Chaldean]	-.343	.244	-.822	.136	-1.402	10932	.161	.710	.440	1.146
	[Black, non-Hispanic]	-.703	.127	-.952	-.454	-5.539	10932	.000	.495	.386	.635
	[Hispanic]	-.082	.191	-.457	.293	-.430	10932	.667	.921	.633	1.340
	[Other, non-Hispanic]	.178	.151	-.118	.473	1.180	10932	.238	1.195	.889	1.605
	[White, non-Hispanic]	.000a							1.000		
Gender	[Male]	.327	.065	.199	.456	5.003	10932	.000	1.387	1.220	1.577
	[Female]	.000a							1.000		
Age	[18-44 yrs]	1.061	.125	.815	1.307	8.457	10932	.000	2.889	2.259	3.694
	[45-64 yrs]	.670	.110	.455	.885	6.109	10932	.000	1.954	1.576	2.422
	[65+ yrs]	.000a							1.000		
Marital Status	[Divorced, Widowed, Separated]	-.080	.088	-.251	.092	-.911	10932	.362	.923	.778	1.096
	[Never married, member unmarried couple]	.068	.094	-.116	.253	.724	10932	.469	1.071	.890	1.288
	[Married]	.000a							1.000		
Education Attainment	[college grad]	.159	.163	-.161	.479	.975	10932	.329	1.173	.851	1.615
	[some college]	.095	.161	-.221	.411	.591	10932	.554	1.100	.802	1.509
	[high school grad]	.086	.160	-.227	.400	.540	10932	.589	1.090	.797	1.491
	[< high school]	.000a							1.000		
Employment Status	[Employed for wages]	.047	.143	-.233	.326	.328	10932	.743	1.048	.792	1.386
	[Self-employed]	.458	.188	.088	.827	2.428	10932	.015	1.580	1.092	2.287
	[Unable to work]	-.606	.199	-.996	-.216	-3.045	10932	.002	.545	.369	.806
	[Homemaker]	.028	.188	-.340	.396	.148	10932	.882	1.028	.712	1.486
	[Student]	-.128	.197	-.515	.258	-.651	10932	.515	.879	.597	1.295
	[Retired]	-.425	.171	-.760	-.090	-2.485	10932	.013	.654	.468	.914
	[Out of work]	.000a							1.000		
Household Income	[<$20,000]	.458	.120	.222	.693	3.810	10932	.000	1.580	1.249	2.000
	[$20,000-$49,999]	.365	.078	.213	.518	4.693	10932	.000	1.441	1.237	1.679
	[$50,000+]	.000a							1.000		
General Health	[excellent or very good]	.053	.069	-.081	.188	.779	10932	.436	1.055	.922	1.207
	[good, fair, or poor]	.000a							1.000		
Insurance	[has insurance]	-1.152	.102	-1.351	-.953	-11.337	10932	.000	.316	.259	.386
	[no insurance]	.000a							1.000		

Dependent Variable: checkup (reference category = 1 within past yr)
Model: (Intercept), race_com, gender, agecat4, marstat, edcat, employ2, income3a, genhlth3, INS
a. Set to zero because this parameter is redundant.

Capacity-building in evidence-informed health-policy for public health students at King Saud University in Riyadh.

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***Keywords:** postgraduate programs, health policy, evidence-informed, capacity building.*

Introduction

Evidence informed policy has great role in strengthening the national health system, it provides the ground for evidence-based distribution of resources and manpower. Department of Family and Community Medicine in College of Medicine at King Saud University (KSU), runs a set of two postgraduate programs namely Masters and Saudi Board in Community Medicine (SBCM) residency program. A two year Masters program was established three years ago and a four year SBCM program was established four years ago. . Postgraduate courses aim to provide high quality public health professionals with sound knowledge on determinants of health in Saudi Arabia and other Arab communities. In addition to the known skills and knowledge of clinical and field epidemiology and medical informatics, the postgraduate programs were designed to equip the graduate with sound knowledge in the use of research evidence in policy making. The program includes courses in evidence-based public health (EBPH) and, advanced epidemiology to use results of epidemiological studies in providing evidence for policy makers. In addition courses on how to use and conduct systematic reviews are integrated in both programs.

Objectives

The objectives of this paper are

1. To investigate the opinion of the students about the courses of evidence based public health with respect to usefulness of the content for future students' career, timing of the courses modules in the curriculum and fairness of the assessment in relation to the content.
2. To explore the knowledge, opinion and attitude of the students towards evidence-based public health and perceived barriers for implementation of evidence based health policy (EBHP).

Methods

The EBPH and AE courses are strategically distributed at the end of the first and beginning of second year of the maters program, and during the third year of the SBCM program, following the basic epidemiology, biostatistics, research methodology, bioinformatics and health economics courses. The courses are designed to provide knowledge and skills in the following seven domains namely 1) Assessment of population health need 2) Support of health priority setting 3) Formulation of objectives 4) Construction of intervention program based on evidence of effectiveness from the literature 5) Development of an implementation plan 6) follow up and interim analysis 7) Evaluation of processes and outcomes. The method of instruction for these courses is based on (case scenarios) in addition to didactic lectures, open discussion and hands-on practical sessions. Evaluation of effectiveness of the courses in building capacity in EBHP was based on the final examination score for the students of a case scenario pertinent to one of the public health problem in their community and a self- administered questionnaire, based on Likert scale of (agree, disagree or uncertain) about 1) knowledge about EBHP 3) their opinion and attitude towards EBHP-related courses and the methods of instruction and assessment,3) Barriers to the implementation of EBHP in the Arab world.

Results

Sixteen students from both programs were included in the evaluation. The mean score on the case scenario examination was 78% with 92% as the highest and 73% as lowest score. Most of the students agreed that the EBPH courses were relevant to their future career and practice (100%), the courses were well situated in the curriculum (93%), and the assessment methods met the course objectives (80%).

With respect to students' opinion and attitude towards implementation of EBHP in the Arab countries; only 53% agreed that EBHP is suitable for implementation in the Arab counties, while 40% were uncertain about such an implementation. More than 80% of the students agreed that in their new position as public health professionals will be able to pursue EBHP (93%) using research evidence including systematic reviews (93%).

With respect to students' perceived barriers for implementation of EBHP most of the students either agreed that 'Lack of forum' of communication between researchers and policy makers and 'Lack of clear system' and programs to incorporate evidence into policy (87% and 93% respectively) are the main barriers for implementation of EBHP in Arab countries. However, 64% agreed that lack of culture of integrating policy and research evidence is a barrier; and less than 50% of the students agreed that lack of budget for research and lack of well qualified researchers and academicians are barriers to EBHP implementation.

Discussion

Our results demonstrate that the postgraduate public health students at King Saud University have positive attitude towards EBHP and towards its curriculum. However, they are aware of the challenges facing the implementation of such policy in the Arab world. The students were realistic about the readiness of the Arab world for EBHP as they listed the lack of official platform and system of communication between researchers and policy makers for the implementation of EBHP as the main barriers. Similar views were expressed by researchers in the east Mediterranean region (EMRO) (1). Although policy makers, in the same region, considered lack of administrative structure as one reason for lack of EBHP in the Arab countries, they listed limited funding, donors' organizations pressure, and delays in reporting the needed evidence to incorporate into policy as the main barriers to implementation of EBHP (2). Other reported barriers include isolation of researchers, and lack of skills to influence policy (3) El-Jardali et al found complete lack of structural process of using evidence to advise policy in many Arab countries (4), though, in the same articles they suggested approaches to incorporate evidence into policy in Arab countries including; development of national strategic plan and scaling up of relevant research (4). We believe developing the trained manpower, during postgraduate education, who believe in EBHP and who have the needed skills and knowledge to search for evidence and to incorporated into policy is a major step in the right direction to establish EBHP in the Arab world.

Conclusion

The postgraduate programs in public health and community medicine at King Saud University, College of Medicine, Riyadh, participate in capacity building in evidence- informed health policy.

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Surveying the Arab/Chaldean Population in the U.S.

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ABSTRACT

Conducting health assessments of relatively rare segments of national, state, or county populations is particularly challenging but highly useful for assessing and addressing health disparities with the general population. In the United States, sampling some rare populations are much more difficult than others. For African Americans, this can be accomplished relatively efficiently because they are numerous and highly concentrated geographically. Such surveys become much more problematic for other groups such as Native Americans, Hispanics/Latinos, Asian Americans, or Arab/Chaldeans. In the case of Hispanics/Latinos and Asian Americans, the major telephone sampling companies (SSI, MSG (Genesys)) have developed surname databases that can be used to draw probability samples from directory listed numbers of subscribers whose surnames match those in the sampling companies' databases. A faculty team at Wayne State University recently developed such a surname database for Arab/Chaldeans. We have used it in combination with a geographic stratification methodology to sample Arab/Chaldeans in Michigan for a behavioral risk factor survey. This hybrid approach yielded the desired sample size planned while significantly reducing the amount of interviewer labor required compared to alternative approaches and while ensuring that all eligible residents of the targeted group had an opportunity to be selected.

INTRODUCTION

Assessing the health of populations is useful for both epidemiological reasons and for planning and evaluation of programs to impact population health. Such assessments are conducted using various methods that may include the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program, patient registries, or surveys.

For general populations, probability-based samples are essential. Consequently, surveys are often the method of choice and these are usually based on either in-person interviews or telephone interviews. While the former tend to be appreciably more expensive, they also enable longer, more detailed interviews. Both are based on self-reported information and are subject to respondent recall error, interviewer effects, and (especially in phone surveys) non-response, and non-coverage. For telephone surveys, the challenges have been growing, especially with the significantly increased prevalence of cell phones.

The challenges are even more daunting for assessing health among relatively rare population groups within the larger general population. Yet, to identify health and access disparities, larger samples of such rare population groups are critical for making meaningful comparisons to the prevalence of indicators in the general population and planning measures to decrease any documented disparities. Arab/Chaldeans living in the United States is one such rare population group[1]. We describe an

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[1] While Arabs are predominantly Muslims, Chaldeans are Christians who practice one of several Roman Catholic rites. They migrated primarily from northern Iraq and their ancestral language is a dialect of Aramaic not Arabic.

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approach we have developed in order to generate probability samples of this population that are efficient and less expensive than alternative approaches making future periodic assessments for gauging trends over time more affordable.

OBJECTIVES

Background

At the national level, two major surveys are conducted annually to assess health in the U.S. population, the National Health Interview Survey (NHIS) and the Behavioral Risk Factor Survey (BRFS). The former is an in-person interview with 35,000 households (containing roughly 87,500 individuals)[1] and the latter is a telephone survey of roughly 500,000 individuals[2]. The total sample size of each is such that nationwide prevalence estimates within small population groups – even without special over-sampling[3] -- are relatively stable and robust. The same cannot be said of estimates within individual states, counties or cities. The smaller the group, the more critical over-sampling is in order to develop useful prevalence estimates for state and local areas. Our focus is on the state of Michigan, an industrial state in the upper Midwest region of the U.S. with a population of nearly 10,000,000.[4]

Within individual states or counties of states, the BRFS telephone survey methodology is by far the most common approach used to assess population health. Sampling is based on generating random samples of telephone numbers from within the sampling frames of phone numbers associated with the geographic area of interest. These frames include landline numbers and cell phone numbers. The cell phone number frame contains no information about the name or address of the subscriber associated with each number. The landline number frame does contain the name and address of the landline subscribers but only for the 50-70% of theses subscribers who have not chosen to have their name and address excluded from phone directories. Thus, the landline frame can be divided into two separate frames, one containing directory listed numbers and one containing unlisted numbers.

For our purposes, a 'rare' population is one which is a small segment (< 15%) of a general population, such that, unless the total sample is very large, a simple random sample would likely yield too few cases within that group to produce stable, robust estimates of population characteristics. Consequently, over-sampling such groups is helpful for producing more precise prevalence estimates.

While these rare population groups might be based on a particular health issue affecting less the 15% of the population, e.g., diabetes, asthma, we are here focused on rare racial or ethnic groups. There are five such groups in the United States that often are the focus of special sampling efforts: African Americans, Latinos/Hispanics, American Indians, Asian Americans, and Arab/Chaldeans.

In the state of Michigan, African Americans – a substantial minority group -- make up roughly 13% of the state's nearly 10,000,000 residents. Asian Americans, Hispanics/Latinos, Native Americans, and Arabs/Chaldeans are appreciably more rare than African Americans. Each of these groups makes up less than 5% of Michigan's adult population (Hispanics/Latinos, 4.6%; Native Americans, 0.7%; Asian Americans, 2.6%, and Arab/Chaldeans, estimated to be between 1.5[2] and5%[3] so, without special over-sampling, the typical statewide or countywide sample includes too few respondents for meaningful analysis within the group.

The Michigan Department of Community Health (MDCH), Health Disparities Reduction and Minority Health Section (HDRMHS) has arranged for Michigan State University's Office for Survey Research to conduct special supplemental samplings of these population groups to augment the sample sizes of these rare population groups as a part of the statewide Michigan Behavioral Risk Factor Survey (MiBRFS). For expense reasons, these cannot be conducted annually, but, instead are being conducted alternatingly on a three or four year rotation. In 2013, MDCH wanted Arab/Chaldeans to be oversampled in a special Michigan Arab/Chaldean Behavioral Risk Factor Survey (ABRFS).

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[2] Based on official U.S. Census Bureau estimates

[3] Based on unofficial Arab American Institute estimates that adjust for the estimated undercounting in official Census totals.

A major objective of the study we report here was to develop a sampling methodology that would:

1. Produce a sufficiently large over-sample of the Arab/Chaldean residents of Michigan to produce stable health estimates,
2. Minimize bias and potential non-coverage errors, and
3. Be cost-effective

Producing an Over-Sample of a Rare Population

There are numerous ways to produce larger samples of a rare population but the other two objectives cannot be ignored. Here are three possible approaches.

Approach #1: Sample More and Screen for Eligibility. One way to produce an over-sample of a rare population is to draw two samples from the general population, one that will produce results for the population as a whole and the other that will – as a supplement -- focus on the rare population only. This second sample would have to be at least as large as the first or several times larger than the first depending on how much the rare population is to be over-sampled. In this second sample, an attempt is made to contact potential respondents at all selected phone numbers. Once contacted, these would be screened for eligibility. All those who are members of the rare population and who therefore are eligible would be interviewed, but all those who are not members of the rare population will be defined as "ineligible" and therefore not interviewed. Although this could satisfy objective 1 and 2, this is obviously highly inefficient and costly.

Approach #2: Geographic Stratification. Another approach is to find a basis for stratifying the population such that the concentration of the rare group to be over-sampled is appreciably greater in one stratum so that more of them would be likely to be selected in a random sample of the stratum. The more dense stratum can then be sampled at a higher rate than the other strata. In the United States this is possible for some racial or ethnic groups because many members of the group tend to live in racially/ethnically homogeneous neighborhoods and telephone numbers have some geographic linkage.

The U.S. Census Bureau divides the nation geographically into census tracts -- relatively permanent, usually contiguous geographic areas in which 1,200 to 8,000 individuals reside with 4,000 being the optimum.[5] These are numbered and their population, economic, and social characteristics are reported based on census surveys. Those tracts that have higher proportions of residents who belong to the rare population group of interest can be identified and grouped with others to form a higher density stratum. Telephone numbers associated with those tracts can then be sampled at a higher rate. The telephone number frame formed by telephone numbers associated with tracts with lower concentrations of the targeted group can be sampled at lower rates.

In the U.S., this works reasonably efficiently in the case of sampling African Americans because they are a substantial minority population (13%) and are highly concentrated in relatively few census tracts. In Michigan, for example, 88.8% of African Americans living in the state reside in just 10 of the state's 83 counties and 70.7% live in a small number of the census tracts in these 10 counties -- tracts in which African Americans represent 50% or more of all residents in the tracts.

However, this approach does not work so well for Latinos/Hispanics or Asians in Michigan largely because they are not geographically clustered in large numbers (although this approach does work in some other states such as California, Texas, or Arizona). In Michigan, this approach is somewhat helpful for sampling American Indians and Arab/Chaldeans who each make up less than 2% of the state's population but are quite concentrated geographically although much less so than African Americans. For example, 46.4% of the Michigan population that lists first ancestry as Arab resides in just 49 of Michigan's 1,378 census tracts but they still make up – on average – only 33.9% of the residents of those 49 tracts. Another 29.9% of Michigan's Arab population lives in 131 other census tracts where they represent only 5.9% of the residents. The remaining 32.7% of Michigan's Arab population is scattered across the remaining 1,199 census tracts, averaging less than 1% of the residents.

On its own, disproportionately randomly sampling phone numbers across strata of tracts aggregated by Arab density would still be much too inefficient and expensive for the Michigan Department of Community Health to afford if it still required calling all the numbers to screen for eligibility.

Approach #3: Surname-Based Approach. Yet another approach would be to stratify the directory listed portion of the landline sampling frame into subscribers whose surnames identify them as probable members of the rare population and those whose surnames indicate they are probably not members. Then the frame of probable members could be used for sampling or sampled at a higher rate.

Two of the large telephone number sampling companies in the U.S., Survey Sampling and Marketing Systems Group (Genesys) that usually generate telephone samples for survey organizations, have previously developed such surname sampling methods for sampling Hispanics/Latinos and Asian Americans. Both Genesys and Survey Sampling obtained lists from the census of surnames associated with individuals who identified their primary race or ethnic group as Hispanic or Latino, and of one of the Asian country backgrounds. They have then used these to construct databases of Hispanic/Latino surnames and of Asian surnames. The surnames of phone subscribers as listed in phone directories can then be compared to these surname databases to identify phone numbers belonging to individuals highly likely to be members of either group so that more targeted sampling is possible. This approach is useful to the extent that the surnames of the groups are relatively unique compared to the surnames of the rest of the population and to the extent that members of the groups have not intermarried much with other racial or ethnic groups.

Hispanic/Latino surnames, Asian surnames, and Arab/Chaldean surnames are sufficiently unique from those of other population groups in the U.S. for this approach to be useful whereas the surnames of African Americans and American Indians are not sufficiently distinctive. Furthermore, the rates of intermarriage between Hispanics and non-Hispanics, Asians and non-Asians, or Arab/Chaldeans and non-Arab/Chaldeans are still very low.

This approach could be much more efficient that Approach 1 or 2, but by itself as a basis for generating the rare population sample, there are drawbacks. It ignores members of the group who have unlisted phone numbers and those with cell phones. Therefore, there is considerable risk of bias from non-coverage error, i.e., the sampling frame does not include a significant portion of the target population.

A Hybrid Approach

Incorporating the efficiencies of Approach 2 and especially 3 with the methodological strengths of 1 and 2 seemed beneficial. That is, trying to identify members of these groups based on surnames as an augmentation to the geographic stratification approach should increase efficiency of identifying eligible respondents while minimally increasing non-coverage error.

Although we proposed creating a surname database for Arab/Chaldeans to Marketing Systems Group, Survey Sampling and the U.S. Centers for Disease Control and Prevention (CDC) several years ago, they were not inclined to pursue it. Fortunately, Professor Kendra Schwartz of Wayne State University's School of Medicine in Detroit and a team under her direction have developed an Arab/Chaldean surname database primarily for medical studies with the approval of the Wayne State University Institutional Review Board.

Schwartz[6] constructed the Arab surname database with the support of the Michigan Department of Community Health by compiling lists of surnames of individuals whose race/ethnicity was entered as Arab or Chaldean or their birthplace as or ancestry from Arab League Countries: Algeria, Bahrain, Djibouti, Egypt, Ethiopia, the Gaza Strip, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, North Africa, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen, and the Western Sahara. Sources culled to find such names included the birth and death records for Michigan housed by MDCH, the Metropolitan Detroit Cancer Surveillance System, Metro Detroit telephone directories, and names supplied by Arab/Chaldean organizations, including the Arab Community Center for Economic and Social Services (ACCESS), the Arab-American and Chaldean Council (ACC), National Arab-American Medical Association, Chaldean Federation, churches, and mosques, as well as internet lists of baby names.

The resulting database contained 9,225 unique surnames. Schwartz [7] has enhanced the database further to include more than 12,000 unique surnames. She has validated the accuracy and completeness of the enhanced database and found in a test study that 91% of those with a surname matching one in the database self-identified as being of Arab or Chaldean descent. On the other hand, a sample of individuals contacted whose surnames did not appear in the database found none that self-identified as being of Arab or Chaldean descent.

As we have mentioned, surname-targeted samples of phone numbers are far from perfect. They can only be performed on directory-listed phone numbers so eligible individuals with unlisted numbers must either be ignored (resulting in potential non-coverage bias if they differ from those with directory listed numbers) or sampled much more expensively. Directory-listed phone numbers may or may not actually be working household numbers at the time interviewers are able to call them. More importantly, not all members of a household typically have their name listed in the directory and eligible women who take the surnames of husbands that are not Arab or Chaldean might not be reachable at all using this approach. This potential non-coverage error would be relatively small if there is little intermarriage among members of the targeted group and the more general population. However, most of individuals that might potentially be missed by the surname targeted approach would be reachable via the usual random digit dial sampling of landline and cell phone numbers in the statewide MiBRFS. Therefore, the sample of interviews gathered by the surname-targeted approach as an enhancement to the geographically stratified approach was designed as a supplement to the completed interviews with Arab/Chaldean respondents from the 2013 MiBRFS. To our knowledge, ours is the first use of Schwartz's surname database for a more general population survey.

METHODS

The Hybrid Approach Sample

For purposes of sampling, the percentage of population with Arab/Chaldean ancestry was examined for each census tract in Michigan. Those tracts in which the percentage of residents with Arab/Chaldean ancestry was greater than or equal to 10% were aggregated to form a High Density stratum. Those in which the percentage was greater than 4% but less than 10% were aggregated to form a Medium Density stratum. Those with a percentage of population less than 4% were aggregated to form a Low Density Stratum.

Addresses of the directory-listed subscribers were placed into the stratum in which each listed phone number belonged. Telephone numbers were randomly selected from within each of the three strata, with the Low Density stratum being sampled at a lower rate. The name and address of the listed subscriber for each sampled telephone number was extracted along with the phone number. The resulting samples of phone numbers and subscriber names were then evaluated by Schwartz's team to identify subscriber names that matched surnames in the surname database. Those that matched were identified for subsequent calling. Those that did not match were excluded from subsequent calling as ineligible.

Although this study did not include a sample of unlisted landline phone numbers, a disproportionately stratified cell phone sample was selected and called. Because cell phone numbers cannot be directly connected to the street address of the subscriber, the geographic stratification to correspond to that used for the landline sample was an approximation at best.

Altogether, the Office of Survey Research (OSR) purchased a sample of 7,450 listed phone numbers from the High Density landline stratum, 10,700 from the Medium Density landline stratum, 29,100 from the Low Density landline stratum, 6,200 from the High Density cell phone stratum and 8,850 from the Medium Density cell phone stratum. The Low Density cell phone stratum was not sampled for cost reasons.

The screening of landline-listed samples against Schwartz's surname database resulted in 2,082 matches for calling in the High Density stratum, 664 in the Medium Density, and 519 in the Low Density stratum.

The Survey

The 2013 Michigan Arab/Chaldean Behavioral Risk Factor Surveys (ABRFS) was designed to complete 400 interviews with English or Arabic speaking, non-institutionalized adults of Arabic or Chaldean background following the research protocol of the Michigan Behavioral Risk Factor Survey (MiBRFS) and approved by the Michigan Department of Community Health Institutional Review Board. MiBRFS is a participating member of the Behavioral Risk Factor Surveillance System (BRFSS) designed and coordinated by the U.S. Centers for Disease Control and Prevention (CDC). CDC has developed a standardized core interview to be administered each year to which each state may add questions of particular interest to the state. CDC specifies a rigorous set of standards regarding respondent selection, informed consent, call scheduling, monitoring, and verification procedures that must be followed.

The ABRFS was conducted from May 23, 2013 to September 30, 2013. The MiBRFS was conducted from January 11, 2013 through January 30, 2014. As part of the ABRFS, OSR mailed advance notice letters in both English and Arabic to the address listed portions of the sample roughly one week prior to releasing a random subset of the entire available sample (the replicate) for calling.

Within selected households reached by landline numbers, OSR randomly selected one respondent to be interviewed from among the eligible adults living in the household (using the Troldahl-Carter procedure). In the case of cell phone numbers called, the individual answering the phone was assumed to be the only potential respondent at the number.

OSR followed the same rigorous calling protocol as is required for the MiBRFS by CDC, especially in terms of total call attempts, spreading calls across time blocks throughout the week, refusal conversion attempts, and monitoring. OSR conducted the telephone interviews using its computer assisted telephone interviewing (CATI) facilities in East Lansing, Michigan.

The Interview Instrument

The ABRFS interview instrument consisted of three major components, the core set of questions specified by CDC, a second set of questions added to the MiBRFS by MDCH for the statewide survey, and a set of additional questions of interest to Michigan State University researchers including: country of origin, time in the U.S., religion, English fluency and literacy, and usual setting for healthcare. The HDRMHS elected to drop a number of the MDCH-added items in the interest of keeping the ABRFS interview shorter.

The final interview instrument contained sections of questions regarding Health Status, Healthy Days - Health-Related Quality of Life, Health Care Access, Hypertension Awareness, Cholesterol Awareness, Chronic Health Conditions, Oral Health, Demographics, Tobacco Use, Alcohol Consumption, Exercise (Physical Activity), HIV/AIDS, Breast/Cervical Cancer Screening, Colorectal Cancer Screening, Adverse Childhood Experiences, Food Sufficiency, Preventive Behaviors, Reactions to Race, Social Context, and Emotional Support and Life Satisfaction.

RESULTS

Outcomes

The final data set consisted of two portions: interviews completed with Arab/Chaldean respondents from the landline and cell phone portions of the 2013 MiBRFS, and interviews completed from landline and cell phone samples specifically designed for the ABRFS.

OSR interviewers completed a total of 400 ABRFS interviews (387 landline and 13 cell phone interviews), which then were supplemented by 136 Arab/Chaldean interviews from the 2013 MiBRFS (76 landline, 60 cell phone) for a total of 536 interviews. Of the 400 interviews completed in the ABRFS, half (202) were conducted in Arabic.

The average number of call attempts for the ABRFS (6.5 landline and 6.4 cell) was greater than for the MiBRFS survey (5.1 landline and 5.5 cell). The number of call attempts for the ABRFS ranged from as few as a single call attempt to as many as 24 call attempts. The median completion time for the ABRFS landline calls, half of which were done in Arabic was about four minutes longer than the MiBRFS calls which were done entirely in English (32.0 vs. 28.3 minutes). However the completion times for the cell portions of both surveys were essentially the same (25.8 vs. 26.3 minutes). The CASRO unweighted completion rate varied considerably. The ABRFS cell completion rate was higher than for the landline (43.7% vs.31.9%) but the MiBRFS landline completion rate was higher than for the cell phone rate (48.2% 33.6%). However, the ABRFS cell refusal rate was higher than the landline rate (20.2 vs. 16.1) while the MiBRFS landline refusal rate was higher than the cell rate (15.1% vs. 11.5%). Perhaps the ABRFS cell phone respondents were younger, more fluent in English and willing to answer the survey in contrast to the MiBRFS cell phone users who might have been young and less willing to participate in the survey.

OSR merged the MiBRFS-originated cases into the data file containing the Arab/Chaldean BRFS cases and weighted the final data set to correct for unequal probabilities of selection (i.e., different sampling rates across geographic strata, listed numbers vs. not-listed numbers, the number of phone lines to the household, and the number of adults living in the household). OSR has also conducted the iterative proportional fitting weighting methodology, i.e., raking, currently being used by BRFSS to maximize the representativeness of the sample findings. This procedure adjusts the sample to match the age x gender, race/ethnicity, education, marital status, sex by race/ethnicity, age x race/ethnicity, homeownership, and landline/cellphone status of the population for 2013 based the 5-year American Community Survey profile of the Arab population of Michigan (available at census.gov). The weighting process reached convergence on the weighted proportions in the cells that were less than 0.5% of the population proportions for all cells within four iterations and all but two cell proportions differed from the population proportions by less than 0.25%.

The final working sample size is 536. The overall margin of sampling error for a sample of 536 with the design effect of 3.3 for the disproportionate sampling involved is ± 7.7% or less. The margin of sampling error will be larger within smaller segments of the sample.

Table 1 provides a demographic profile of the weighted final sample.

Table 1. Demographic Profile of the Weighted Arab/Chaldean Sample, 2013

Characteristic		Arab/ Chaldean Sample (n=536)
Sex	Male	52.2%
	Female	47.8%
Age	18-24	17.5%
	25-34	22.5%
	35-44	20.8%
	45-54	18.2%
	55-64	10.7%
	65-74	7.9%
	75+	2.5%
Education	< High School	23.6%
	High School Grad.	22.0%
	Some College	24.2%
	College Grad. +	30.2%
Marital Status	Married	59.1%
	Single (never married), Unmarried couple	28.1%
	Divorced, Widowed, Separated	12.8%
Home Ownership	Own	63.4%
	Rent	29.3%
	Other	7.3%
Employment Status	Employed for wages	41.0%
	Self-Employed	9.1%
	Out of work (> 1 year)	4.1%
	Out of work (< 1 year)	7.0%
	Homemaker	14.4%
	Student	8.8%
	Retired	8.7%
	Unable to Work	6.8%
Children <18 in Home	Yes	56.4%
	No	43.6%
Household Income	< $20,000	33.1%
	$20,000 - 34,999	25.0%
	$35,000 - 49,999	10.1%
	$50,000 - 74,999	6.1%
	$75,000 +	25.6%

Efficiency

The primary purpose of this innovative approach to sampling Arab/Chaldeans as a rare population in Michigan was to generate a representative sample more efficiently and less expensively than alternative approaches. Among the numerous alternatives, we will discuss three: enlarging the MiBRFS to produce an similarly large sample size of Arab/Chaldean respondents, the geographic stratification approach alone, and the hybrid approach involving geographic stratification and surname screening.

Enlarging the MiBRFS. The 2013 MiBRFS was designed to complete a total of 12,000 interviews with some modest over-sampling of less populated counties. In 2013 this sample generated only 136 interviews with Arab/Chaldeans. Enlarging the MiBRFS sample size so that it would generate an equivalent 536 interviews with Arab/Chaldean respondents would have required increasing the total number of completed interviews to roughly 47,300 with a concomitant 3.9 times increase in the cost of the survey. But using a geographic stratification approach with surname screening approach we took to obtain the additional 400 interviews cost only 2% of the cost of this alternative.

Geographic Stratification Only. The geographic stratification sampling approach would be the same approach we used that incorporated the use of the surname database with one exception – we eliminated the need to call many of the listed landline phone numbers that were sampled because their subscribers' surnames did not match names in the database. We estimated the total number of phone numbers to sample from each stratum of the listed phone number sampling frame based on the expected yield of reachable, eligible, cooperative respondents we would contact with the percent eligible based on the average percentage of residents who are Arab/Chaldean within the stratum of census tracts.

Table 2 shows the total sample of listed numbers drawn from each of the three strata and the number of subscribers within each that matched surnames in the Schwartz surname database. In the geographic stratification-only approach, all of the phone numbers sampled within each would have to be called to locate eligible respondents and gain cooperation to complete the desired number of interviews.

Table 2. Sample Not Used and Calls Not Made Because of Surname Screening Augmentation to Geographic Stratification-Based Sampling

	Stratum			
	High Density	Medium Density	Low Density	Total
Listed Sample Drawn	7,450	10,700	29,100	47,250
Listed Sample to Call After Surname Screening	2,082	664	519	3,265
% of Listed Numbers that Matched Surnames	27.9%	6.2%	1.8%	6.9%
Listed Sample Numbers That Did Not Match (i.e., no calls required)	5,368	10,036	28,581	43,985
Ave. Numbers Calls to Reach Final Disposition	6.8	6.4	6.1	6.6
Calls spared	36,502	64,230	174,344	275,077
Hours of Calls Spared (@ 20/hr.)	1,825.1	3,211.5	8,717.2	13,754

Table 2 also shows the number of sampled phone numbers within each stratum that did not need to be called because their surnames did not match and were, therefore, coded as ineligible. The table indicates that the geographic stratification-only approach would have necessitated calling 43,985 more sampled phone numbers than we did using the surname screening approach. In addition the average number of phone calls required to reach a final outcome disposition for each sampled phone number that was called but which turned out to be not eligible for the study. The overall average number of calls made per phone number was roughly 6.6 calls.

Multiplying the average calls required to finalize out ineligible phone numbers (6.6) by the total number of phone numbers that were coded ineligible when compared against the Schwartz database (43,985) produces the total number of phone calls that interviewers did not have to make as a result of the augmentation by the surname-matching. The total number of phone calls avoided was 275,077. Since, for this study, interviewers made an average of 20 calls per hour, the geographic stratification-only approach would have required an additional 13,754 hours of interviewer time to make the additional calls required if we had not used the surname-screening approach to augment the geographic stratification sampling.

CONCLUSION

Using surveys to assess health, access to care, and health care utilization is especially challenging when the population of interest is a relatively rare segment of the larger population. Within the U.S. and its individual states, residents with Arab/Chaldean ancestry constitute such a rare population. Yet, the interests of the group regarding its own health and well-being and those of government entities, health foundations and voluntary health associations drive the need for conducting such surveys. Finding ways to accomplish these in cost effective manners while yet adhering to rigorous sampling and data collection methods is essential for continual health surveillance.

We have described an innovative use of a recently developed Arab/Chaldean surname database system to screen samples of listed phone numbers for eligibility in a survey of Arab/Chaldeans in Michigan. The listed phone numbers were drawn from sampling frames of phone numbers aggregated within each of three strata formed by census tracts grouped based on their percentage of residents with Arab/Chaldean ancestry.

The approach described proved to be highly successful and produced almost exactly the yield of completed interviews with eligible respondents as expected. Moreover, the approach proved to be demonstrably more efficient than two of the obvious alternative approaches to generating such a sample.

We believe the approach and the surname database Professor Schwartz and her colleagues developed are potentially useful well beyond the boundaries of the state of Michigan where this survey was conducted. Michigan is home to one of the largest populations of Arab/Chaldeans in the world outside of the Middle East, so the surname data base should be useful in other U.S. states where the Arab/Chaldean populations are not as great without much fear of non-coverage error.

The combining of MiBRFS respondent data from listed and unlisted landline numbers and cell phone numbers with ABRFS respondent data from the surname-screened listed numbers and cell phone numbers ensured that all Arab/Chaldean residents with telephones had the possibility of being included.

We chose not to sample landline phone numbers not listed in phone directories in the ABRFS survey. If we were to do this again, we would likely change this decision. We had expected that many of those who would otherwise choose to have an unlisted phone number would simply have transferred from a landline phone to a cell phone instead. However, our cell phone sample yields were lower than we had expected, which suggests we may have over-estimated the migration from unlisted landline to cell phone. Although the median completion time for the ABRFS was longer than those for ABRFS cell and MiBRFS landline and cell calls, the ABRFS refusal rate for landlines was less than the refusal rates for cell calls. We believe that if we had included a sample of unlisted landline phone numbers it would have reduced the risk of bias but would also have increased costs.

The efficiency of the approach greatly increases the possibility of periodically repeating the survey to monitor trends in the health and access to care of this rare population – an important purpose of such health assessments.

Endnotes

1 “About the National Health Interview Survey.” National Center for Health Statistics Centers for Disease Control and Prevention. http://www.cdc.gov/nchs/nhis/about_nhis.htm

2 “About the Behavioral Risk Factor Survey.” Centers for Disease Control and Prevention http://www.cdc.gov/brfss/about/about_brfss.htm

3 For some time, the NHIS has been over-sampling African Americans and Latinos/Hispanics. More recently, it also involves over-sampling Asian residents.

4 http://quickfacts.census.gov/qfd/states/26000.html

5 https://www.census.gov/geo/reference/gtc/gtc_ct.html

6 Schwartz K, Kulwicki A, Weiss L, et al. Cancer among Arab Americans in the metropolitan Detroit area. *Ethnicity and Disease.* 2004;14(1):141-146.

7 Schwartz, K., G. Beebani, M. Sedki, M. Tahhan, J.J. Ruterbusch. “Enhancement and validation of an Arab surname database.” *Journal of Registry Management*. 2013; 40(4):176-179.

An Environmental Scan of the Arab-American Diaspora's Health

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Abstract

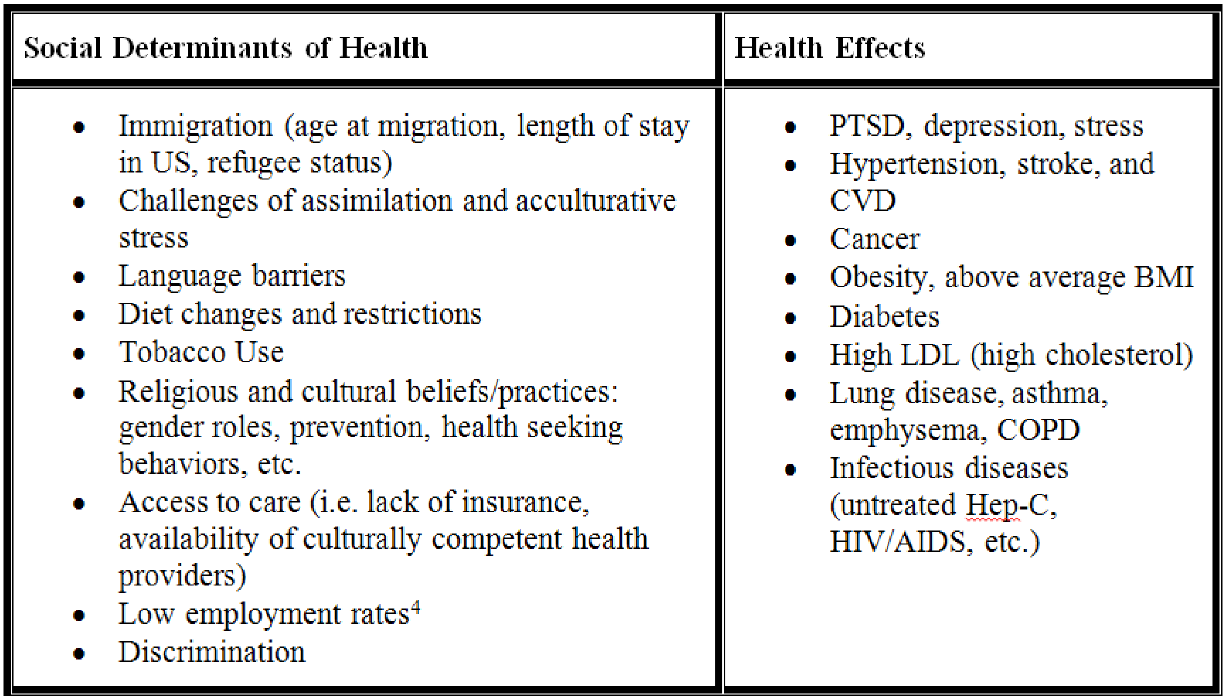
Research was conducted to evaluate the health resources available for individuals of Arab descent living in America. There are an estimated 3.6 million Arab-Americans living in the United States.[1] Despite being an ethnic minority, Arab-Americans are not represented in many national discussions and programs pertaining to minority health. The study conducted an environmental scan and landscape analysis using survey tools and interviews of organizations and leaders that work specifically to serve the Arab-American community throughout the United States. The researchers found most organizations were not represented nationally nor did they have enough resources to effectively carry out their missions pertaining to achieving a greater health impact among the Arab-American community, therefore highlighting service gaps. The most prevalent health problems seen among their patients and clients included diabetes, cardiovascular disease, mental health, and child health. Without the adequate financial resources, human capacity and resource development, and physical space available, these organizations are not able to meet their full objectives and goals. This study shows the organizational resource gaps necessary for groups and program to effectively serve the health needs of Arab-Americans.

Introduction

When the United States began implementing its first health care reform bill in decades—the Affordable Care Act (ACA)—minority health groups nationwide utilized the opportunity to address their communities' health disparities. Although Arab-Americans are an underserved health population, they often are not counted as a minority group in the national discussions on minority health. Despite this exclusion, research has shown Arab-Americans disproportionately suffer from health conditions such as diabetes, cardiovascular disease, cancer, and mental health disorders both from genetic and environmental causes. This, in addition to the fact that Arab Americans have unique social determinants that impact their overall health and their health-seeking behaviors, warrants further research and assessment of the community and those that service it.

An Arab-American is defined as an American whose descent can be traced to any one of the 22 Arab nations; these include Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen.[2] There are several contributing factors, or health determinants, that separate the needs of Arab-Americans and their ability to access health care services from the general United States population, which are listed below in Table 1. These factors indicate that Arab-Americans are an at-risk population for health disparities, requiring targeted attention outside of the general population.[3]

***Table I:** Social Determinants of Health and Resulting Health Effects: The chart below lists social determinants of health in the Arab-American community and the health effects that can result from one or a combination of several of these factors iii*



Social Determinants of Health	Health Effects
• Immigration (age at migration, length of stay in US, refugee status) • Challenges of assimilation and acculturative stress • Language barriers • Diet changes and restrictions • Tobacco Use • Religious and cultural beliefs/practices: gender roles, prevention, health seeking behaviors, etc. • Access to care (i.e. lack of insurance, availability of culturally competent health providers) • Low employment rates[4] • Discrimination	• PTSD, depression, stress • Hypertension, stroke, and CVD • Cancer • Obesity, above average BMI • Diabetes • High LDL (high cholesterol) • Lung disease, asthma, emphysema, COPD • Infectious diseases (untreated Hep-C, HIV/AIDS, etc.)

The Arab-American population experiences higher prevalence rates of several health conditions in comparison to the general U.S. population, including hypertension and post-traumatic stress disorder (PTSD) as a result of trauma associated with immigration, acculturation, loss of social support, and limited knowledge of the complex US health system.[4]

> *"They lack the knowledge that is needed to prevent, detect, and treat diseases. This population faces many barriers to accessing the American health care system. Some barriers, such as modesty, gender preference[5], and illness causation misconceptions, arise out of cultural beliefs and practices. Other barriers are related to the complexity of the health care system and the lack of culturally competent services,"[6]* writes Odeh Yosef in the *Journal of Transcultural Nursing.*

Most studies on the social determinants impacting Arab-American health have been conducted on specific Arab-American samples and subpopulations, mostly by geographic regions, in the US. However, there appears to be a lack of national data demonstrating the actual burden of specific conditions and disease on the population. These studies, however, have indicated that Arab-Americans experience and access health care differently than the general US population.[iii] This, compounded with the social determinants influencing Arab-American health care and the lack of culturally competent care,[1] necessitates the need to collect local and national health data to improve the programmatic and organizational structures; facilitating the healthcare

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[1] A study conducted by Kulwicki, Miller and Schim, *Collaborative Partnership for Culture Care: Enhancing Health Services for the Arab Community* (2000) found that the complexity of the health care system on Arab clients, the unique caring behaviors of Arab families, communication gaps as obstacles to the provision of culturally competent care, the diversity of the perception of cultural competency, obstacles to the accessibility of health services, and workforce diversity issues made it very difficult for patients to seek and understand care. Thus providing further evidence of the need for cultural competency training programs at health facilities for health care professionals and administrators requiring a more robust push for enhanced research, programming and advocacy for the Arab-American community. *Kulwicki, A., Miller, J., & Schim, S. Collaborative Partnership for Culture Care: Enhancing Health Services for the Arab Community. Journal of Transcultural Nursing, Vol. 11 No. 1 January 2000 31-39© 2000 Sage Publications, Inc.*

system to adequately meet the needs of the Arab-American population. The researchers designed an environmental scan and analysis of Arab-American organizations to identify the current implemented health initiatives and the perceived health needs of organizations in the Arab-American community.

Objectives

The primary objectives of the study were to understand gaps in resources and services in terms of Arab-American health, document the perceived need of health programming targeted towards Arab-Americans, and to develop policy recommendations that address the disparities and the social determinants of health within the community. This was achieved through an environmental scan of research and health services focused on Arab-Americans, interviews with Arab-American or health-focused groups and leaders, and a social media campaign to leverage awareness and participation in the study.

Methods

Participants

Data from 11 Arab-American organizations were analyzed in the study, out of 28 contacted and 52 observed. Participant organizations ranged from local grassroots organizations to national professional advocacy groups. Only those organizations with primary missions to serve the Arab-American health community, based in the United States, were identified and asked to participate in the study.

Procedures

In preparing the study, the researchers outlined important aspects of understanding the health needs of the Arab-American diaspora and the services available to meet those health needs. Due to the diversity of the Arab-American population, including generational, religious, and regional/cultural differences, the researchers developed a questionnaire that would elicit responses on several segments of the diaspora.

The environmental scan and gathering of organizational contact information was completed using qualitative methods of multiple components, including:

- Conducted literature review on most prevalent chronic health issues in Arab-American community
- Published a blog series on Arab-American health issues to raise awareness and elicit public health professionals' interest, implementation ideas, and capacity building needs
- Leveraged social networks through social media campaign, using Twitter and Facebook
- Contacted Arab-American health professionals and organizations to understand challenges and progress in research and program development.

Literature Review

The researchers conducted a literature review of studies available on Arab-American health. The literature review revealed that there was very limited data available on health disparities, as well as initiatives to address Arab-American health. The research also showed the prevalence of various chronic physical and mental diseases among this population, while also depicting the dearth of community based programs designed to address Arab-Americans' specific social determinants of health.

Blog Series

Following the literature review, the researchers authored a three-part blog series over a two-month period featured on a prominent health blog in the Middle East titled as listed below:

- Part I: Arab Americans in Health: Why are we missing?
- Part II: Arab Americans in Health: Why are we important?
- Part III: Arab Americans in Health: How do we get involved?

The purposes of these blog posts were to raise awareness and elicit input from stakeholders and public health professionals on interests, implementation ideas, and capacity building needs. Several individuals and organizations contacted the researchers and shared the blog posts via social media.

Leveraged Social Networks

Throughout the environmental scan, the researchers leveraged social networks to establish a campaign to spread information about the scan and search existing entities; ensuring that as many stakeholders were contacted as possible. The researchers initially used social media to identify organizations and leaders with interest in Arab-American health. The researchers specifically used Twitter and Facebook to develop the sample.

Contacted Arab-American Organizational Leaders

To assist in understanding the landscape and current status of Arab-American health, the researchers compiled a list of Arab-American organizations, consisting of professional organizations, cultural organizations, and social services organizations. When possible, the list included the organization name, primary contact person, email address, and phone number. While the researchers anticipated that some of the organizations on the list may not have data or experience with health care or services, they may be able to direct them to other organizations or individuals. The list consisted of 52 organizations.

The researchers then developed criterion to determine which organizations were eligible to participate in the scan. The criteria included whether the organization is based in the United States, serves the Arab-American population, and provides health services or resources.

Once the organizations were qualified against the criteria, 16 organizations failed to meet the minimum criteria and were excluded from the study. The study aimed to interview leaders within the respective organizations, given their extensive knowledge of their programs, experience working with the Arab-American community, and awareness of resource gaps in their organizations.

Tools

The researchers developed a survey of items regarding general organization information demographic parameters for populations served, challenges in health research and program development, progress with programs implemented, and suggestion for understanding gaps in care. The researchers then reached out to the organizations on the list in order to obtain survey responses, initially via multiple emails. The survey was sent out in a Google Form format through which all responses would automatically be recorded in an Excel file. The emails failed to elicit any responses. The researchers employed a research assistant to conduct informational interviews telephonically, to complete the survey. Through the telephonic interviews, the research assistant attempted to reach out to the remaining 36 organizations. Of those remaining organizations, 8 organizations chose not to participate because they did not believe they met the criteria to participate. This reduced the population size (N) to 28 organization participants. Of those, 19 organizations did not respond and 11 completed the survey, defining the sample size (n). The overall response rate was 39.29% (Table 2) from organizations across the nation (Table 3).

Table II. *Number of organizations included in study, and survey response rate*

Definition of Measurement	Number of Organizations
Total potential organizations on initial list	52
Organizations deemed not fitting criteria by researchers	16
Organizations declared not to fit study criteria, and chose not to participate	8
Organizations that fit study criteria (N)	28
Organizations that did not respond to survey	19
Organizations that completed survey (n)	11
Response rate: n/N= 11/28	**39.29%**

Table III. *Location of Organizations in sample (N=11)*

Location of Organization
Anaheim, CA
Brooklyn, NY
Chicago, IL
Cleveland, OH
Clifton, NJ
Houston, TX
Lackawanna, NY
Manhattan, NY
Orlando, FL
Philadelphia, PA
Troy, MI

Univariate analysis was completed, using frequencies and descriptive statistics to explore the demographic scopes of the organizations, the disease areas most prevalent in the target populations, types of organizational resources required to meet goals and objectives, as well as other collaborating organizations.

Results

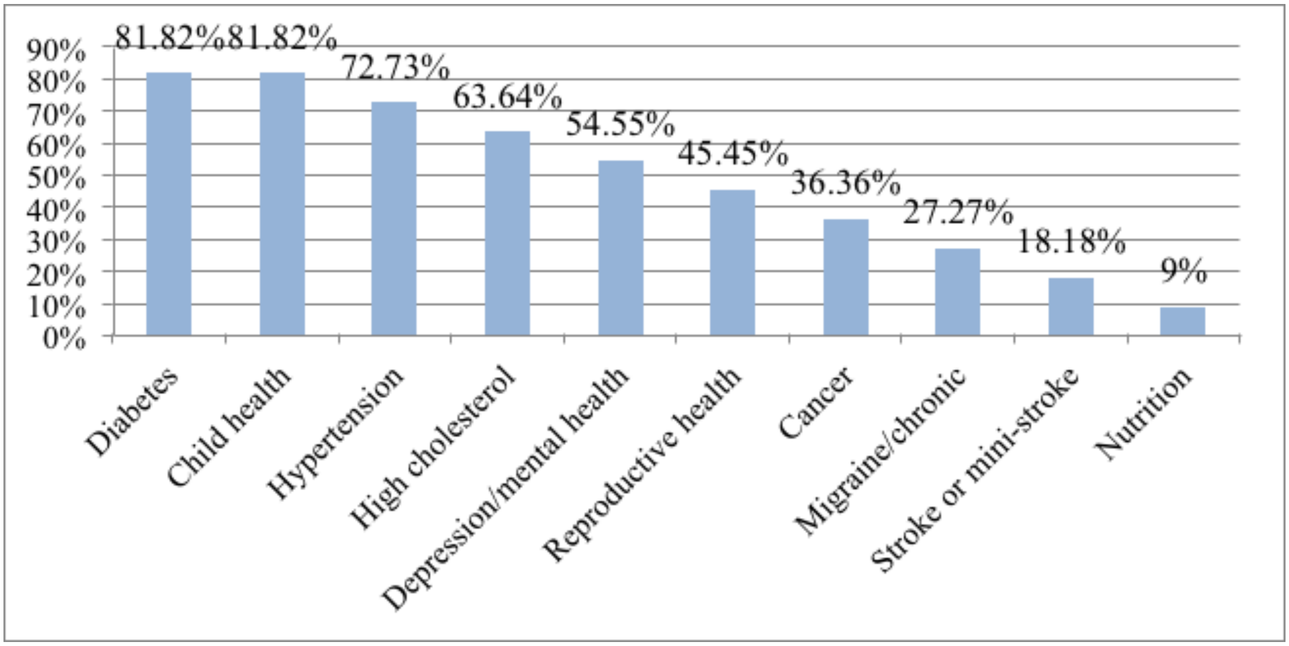
Table 4 represents the scope and demographic in which the 11 organizations sampled provide resources and/or services. The majority of organizations in the sample serve their local communities primarily (54.55%), however, some also serve the wider state population (27.27%). Two organizations (18.18%) also included national and international work in their scope. In terms of the socio-demographics of the populations that these organizations serve, all of the groups work directly with immigrants and the overwhelming majority also serve 2nd or 3rd generation Arab-Americans (90.91%) as well as refugees (72.73%). A smaller number of organizations (18.18%) also mentioned that along with serving the Arab population in their community, they also serve a large number of clients from across low income groups.

Table IV. *Description of the demographics that sample organization serves (N=11)*

Variable	n	%
Scope of services		
Local only	6	54.55%
Local and state	3	27.27%
Local, state, national, and international	2	18.18%
Primary demographic		
Immigrants	11	100%
2nd and subsequent generations	10	90.91%
Refugees	8	72.73%
All low income populations	2	18.18%

Furthermore, the respondents from the respective organizations were asked to report on the main health issues in which their communities suffer. Figure 1 displays the percentage of reported health disease areas listed by the sample. Health issues related to diabetes and child health were reported at the highest rates (81.82% and 81.82%, respectively). However, hypertension (72.73%) as well as high cholesterol (63.64%) were also frequent conditions exhibited in the communities nationally. Services for the treatment of Depression, as well as, many other mental health conditions (such as anxiety, PTSD, autism, etc.) were provided across the organizations (54.55%). Other health areas that clients seek services for are related to reproductive health and family planning (45.45%), cancer screenings (36.36%), migraines/chronic headache (27.27%), stroke or mini-strokes (18.18%), and issues relating to nutrition (9.09%).

Figure I. *Percentage of reported health issues patients suffer from, across organizations sampled. (N=11)*



Given the vast variety of chronic and debilitating health issues that patients seek services for at the organizations sampled, only 36.36% of the groups reported to have the resources available to serve the population sufficiently, with 63.64% of the sample reporting that they are in need of adequate resources. Many of the organizations also collaborate with other types of organizations to achieve their missions (Table 5), with most reporting to work with other non-profits (72.73%). It is also common for these organizations to collaborate with religious groups (36.36%) such as mosques, churches, and charities; governmental entities and programs, whether local, state or national (27.27%); hospitals (27.27%); academic, educational, or other training institutes (27.27%); as well as international organizations (9.09%).

Table V. *Types of organizations in which sample organization collaborates (N=11)*

Variable	n	%
Collaborating organizations		
Non-profit	8	72.73%
Religious	4	36.36%
Governmental entities/ programs	3	27.27%
Hospitals	3	27.27%
Academic/educational	3	27.27%
International	1	9.09%

When asked what additional resources their organizations need in order to fulfill their health goals for their respective communities, the respondents most frequently reported staffing limitations (45.45%)—either in terms of limited staff as well as a need for professional capacity building (such as more certified health professionals and more widely available culturally competent staff). The lack of funding (36.36%) was also commonly reported amongst the organizational leaders. Other resources and issues were mentioned related to educational materials and programs around health literacy (18.18%); physical spaces available to serve the community (9.09%), as well as time limitations (9.09%) were also reported.

Discussion

The current study explored the organizational capacities and resources that serve Arab-Americans across the United States. Through this environmental scan and analysis, this study provided a unique perspective on the types of health services available for Arab-Americans. Furthermore, the existing organizations were founded to target factors related to social determinants of health of Arab-Americans. The missions, goals, and objectives of many of these organizations aim to address the cultural, religious, and social factors that shape Arab-Americans' perceptions of health, access to care, and overall physical and mental well-being. The organizational leaders interviewed were knowledgeable about their clients' needs and passionate about serving their respective communities.

The range of cities that the organizations in the sample covered was expansive and regionally diverse. These cities were located in or outside of metropolitan areas known to have higher densities of Arab-Americans. According to the Arab American Institute's research, the study sample includes most of the top states, listed in order by highest Arab population: California, Michigan, Florida, Texas, New Jersey, Illinois, Ohio, Massachusetts, and Pennsylvania.[7]

Most of the organizations interviewed served local populations solely, which may be due to the resources available and the feasibility of extending services to the larger geographic areas. This study also showed that, generally, organizations such as these are community and social service centers meant to help new immigrants become established in an unfamiliar environment as easily and healthily as possible. However, given their relationship with the community, understanding of cultural sensitivities, and experience, these organizations continue to serve subsequent generations of Arab-Americans as well, along with other low- income groups.

Some of the study limitations include that the sample used was not necessarily representative, as the list of organizations was compiled through grey literature research, snowballing, social networking, and through recommendations. With limited time and access to the sample across the nation, it was also challenging for the researchers to reach out multiple times to unresponsive organizational leaders. Additionally, there were a number of organizations that were lost to follow-up (those who said they would complete the survey online later and did not). However, this was the first landscape analysis conducted on Arab-American health organizations, and therefore it adds to the literature on this ethnic group.

Despite these limitations, the most prevalent health issues seen at the health facilities and community centers were related to diabetes, cardiovascular disease, mental health, and child health. These findings align with previous studies on Arab-American populations, showing disproportionately higher rates of diabetes among Arabs than non-Hispanic whites (9%), African-Americans (10%), and Hispanics (11%), based on the National Health and Nutrition Examination Survey III.[8] Studies in Southeast Michigan and Washington, DC also found higher rates of cardiovascular disease and cholesterol among Arabs in the respective regions, compared to other minority groups.[9],[10],[11] Other recurring health issues among Arab-Americans also reported in this study included post-traumatic stress disorder (PTSD), reproductive health and family planning, and various forms of cancer. The social determinants that lead to such health effects include the process of immigration itself, challenges of assimilation and acculturative stress, language barriers, nutritional habits and changes, tobacco use, religious practices, health insurance access, low employment, and discrimination. The interview responses touched on each of these social determinants, in varying degrees depending on the organization. For example, common barriers to health care reported by the organizational leaders included health insurance, provider awareness, educational limitations, as well as health literacy and the lack of language resources.

With the formidable challenges and objectives these organizations are determined to address, it is critical to emphasize that most do not have the adequate resources to effectively meet the health needs of their communities. Although some organizations and projects are provided funding from the counties and states in which they are located, the lack of legal minority status for Arab-Americans limits the potential of funding and governmental programming that can be made available. Another important issue was related to the need for more trained and certified health professionals to work in these settings. Furthermore, human resource limitations are compounded by the need for health professionals who are trained in or understand cultural competency in treating and serving the Arab-American population.[iii] There are more generalized and specialized care needs for these communities that are not feasible for these groups to provide with limited funding, staffing, time, human capacity availability and development, and office or clinic space accessible to them. Through this study and continued research, it is important that more advocacy and analysis is conducted to shed light on organizational needs of those who are working to improve the health and overall wellbeing of Arab-Americans throughout the United States.

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A Health Needs Assessment of Arab-Americans in the Washington, DC Area

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Abstract

Introduction

Arab-Americans are a minority group that has been given much attention in the media recently; however the impacts of this attention on their health have been dismally neglected. Arab-Americans make up a relatively recent immigrant group in the United States who have been marginalized and overlooked with regards to their well-being.

Objective

Arab-Americans often face various health challenges due to the trauma and stress associated with immigration, cultural conflict in the US, loss of social support, and limited knowledge of the complex U.S. health system. However, there is a paucity of research examining health risks and behaviors among this ethnic group. This study assessed the health needs among Arab-Americans living in the Washington, DC metropolitan area.

Methods

This observational study is based on a convenience sample of Arab-Americans living in the Washington, D.C. metropolitan area. The sample included 122 English-proficient men and women 18 years and older who self-identify as Arab-American or of Arab descent. Participants were recruited to take the online survey via e-mail listserves, social networking sites, and from a previous sample of study participants from a cardiovascular disease study. Specifically, this study examined health care access and utilization, perceptions of health issues, risk behaviors, and health status among Arab-Americans adults. It also measured for associations between reported depression, perceived discrimination, acculturation, and health.

Results

Quantitative analysis showed correlations between age groups and current tobacco use, where the 18-29 years age group smoked tobacco products significantly more than the older age groups in the past 30 days (χ^2= 6.83, p= 0.03). However, there was no significant difference in current tobacco use between males (34.1%) and females (22.8%). There was also a significant relationship between depression and age groups, with the 18-29 years group reporting higher depression scores (F= 5.17, p= 0.009). Mean depression scores were also significantly higher among females (14.58) than males (9.50) and among those born in the US (15.54 vs. 11.16). Perceived discrimination was also positively correlated with depression, measured on the CES-D scale (F=6.02, p=0.004). . Men were more likely to report having diabetes (p=0.017) than women. The sample scored high on both acculturation sub-scales (mainstream and heritage culture), representing that they felt mainstream American culture as well as their heritage culture being important factors in their lives.

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Conclusion

Results suggest that health promotion programs for Arabs in the DC area may help reduce health risks. Information collected from this research will be gathered to design and eventually implement health promotion programs for Arabs and Arab-Americans, based on the needs assessment of this community.

Introduction

Arab-Americans make up a relatively recent immigrant group in the United States. However, it is a minority group that has been overlooked with regards to their well-being. An Arab-American is an American whose ancestors originated from any one of the 22 Arab nations; these include Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen [1]. From 1990 to 2000 the Arab-American population increased by 65% nationally [2]. As one of the fastest growing immigrant populations in the US, with over 3 million Arab-Americans in the nation, healthcare needs and prevention are necessary for their well-being [3].

Although Arabs were migrating to the United States since 1875, this group has faced hardships related to acculturation and discrimination. The American-Arab Anti-Discrimination Committee (ADC), based in Washington, DC, reported more than 700 violent acts towards Arab- Americans during the first 9 weeks after September 11, 2001 [4]. Over the first 6-month period after September 11th, there were significant increases in reported airline discrimination, denial of service, police and FBI misconduct, employment discrimination, and physical and psychological attacks on Arab-Americans [4]. The physical, and moreover, the psychological effect of these events alongside institutionalized racism and discrimination create a compounding effect of stress and pain on the Arab-American population [1]. Furthermore, a study found that 53% of a sample in Florida reported being treated unfairly by strangers due to their Arab descent, and 46% said they were called racist names in the past year [1]. This study also found a correlation between perceived discrimination and psychological distress (r=0.32), that was comparable to the psychological distress due to recent racism experienced by African Americans (r=0.31) [1].

Perceived discrimination, acculturation, and immigration are risk factors for chronic and mental illnesses among Arab immigrants and Arab-Americans. These specific stressors can lead to health problems related to mental health and depression, heart disease, and diabetes [5,6,7,8,9,10]. A study on Arab immigrants in Southeast Michigan found that 54.6% of all participants had a total cholesterol HDL ratio greater than 4.5 [5]. In a sample in Washington, DC, the self-reported hypertension among both men and women was 16.3%, and high cholesterol rates exceeded the national average at 37.6% [6]. Also, self-reported surveys showed that 20% of Arab-Americans reported having heart disease; as compared to 12.5% of African Americans in a sample in Southeast Michigan [8]. The prevalence of diabetes among Arab-Americans across the literature ranges from 16-33% [2]. These studies depicted a greater prevalence among Arabs than non-Hispanic Whites (9%), African-Americans (10%), and Hispanics (11%), based on data from NHANES III [2]. The rates are disproportionately high, and the effects are multifaceted. Type II diabetes among this group was also significantly associated with acculturation and greater hip-to-waist ratio [6,10].

Arab immigrant men were more likely to be smokers (18.52% of a sample in Southeast Michigan), which presents itself as a stress reliever and risk factor for heart disease as well as for multiple other health problems [5]. Few Arabs, both men and women, engage in physical activity and also do not have information on their family history since cause of death is not regularly recorded in their countries of origin [5]. These social stressors and risks also lead to higher risks of chronic disease. Therefore, monitoring and assessing the risks of this minority group is a public health responsibility.

Mental health can have the most debilitating and overbearing consequences on wellbeing, and is affected by the stressors of discrimination, acculturation, and trauma that Arab-Americans face. Depression in Arab-Americans has been reported to be at 23.2%, with prevalence rates varying further by country of origin [11]. After September 11th, 67% described an overall increase in stress levels, and less than half noted that their health had been negatively impacted by war and hate crimes [4,12]. The forms of perceived discrimination and racism reported ranged from physical violence or abuse, threats, insults or name-calling, and being treated unfairly [12]. Many faced pre-migration traumas, depicting incidents of war, crime, general disaster, physical and sexual abuse, and/or military occupation [11].

Given the paucity of research, as well as risk factors prevalent among Arab-Americans, a greater understanding of the health issues facing this community is needed. Furthermore, about 94% of Arab-Americans live in metropolitan areas throughout the United Sates, with Washington, DC being the fifth greatest concentrated area of Arab-Americans [15]. However, there have not been any studies conducted on Arab-Americans in the Washington, DC metro area in terms of health needs and stressors. The following study examined health access and utilization, risk behaviors, health status, acculturation, and discrimination among Arab adults in the Washington, DC region.

Objectives

The objective of this study was to assess the health needs and disparities among Arab-Americans living in the Washington, DC metropolitan area. Specifically, this study:

1. Examined health care access/utilization, perceptions of health issues, risk behaviors, and health status among Arab-American adults living in the DC area.
2. Examined the relationship between socio-demographics and health care access/utilization, perceptions of health issues, risk behaviors, and health status among Arab-American adults living in the DC area.
3. Examined the relationship between acculturation, stress, discrimination and health.

Methods

Data Collection

The survey instrument contained 36 questions that included items on socio-demographic characteristics, risk behaviors, depression, medical history, health access and utilization, discrimination, and acculturation. The study was reviewed and approved by The George Washington University Internal Review Board (IRB # 021205). _

The survey was distributed online using e-mail list-serves and social networking websites. Eight different Arab professional and student associations, as well as two major churches, were contacted to participate in the study. Participants were informed that they must self-identify as Arab; be over the age of 18; live in the Washington, DC area; have English fluency skills; and have access to a computer to complete the survey questions online. All participants were notified that their responses were anonymous, confidential, and voluntary.

Participants

The metropolitan DC area — including Washington, DC, Virginia, and Maryland — is the home to about 85,618 Arab-Americans based on limited Census information gathered about this population [15]. The sample included 122 self-identified Arab or Arab-American men and women. Table 1 lists the numbers and percentages for each socio-demographic characteristic of the sample. The sample consisted of 64.8% females and 33.6% males, and ranged in age from 18 to 60 (M= 33.78, SD= 14.75). Under half of the sample was born in the United States (40.2%), however 71.7% have lived in the US for 16 years or more (M= 22.10, SD= 11.77).

Most of the participants were employed (60.7%), however 5.7% were unemployed; the remaining identified themselves as students (23.8%), self-employed (4.1%), homemakers (2.5%), or retired (2.5%). The majority of the sample was Muslim (86.9%) and some were Christian (11.5%). Almost half of the participants reported that they have attained graduate degrees (48.4%); the remaining educational levels were split amongst college graduates (38.5%), those who have completed some college (10.7%), and those whom have high school degrees or equivalent (1.6%). Annual household income was high, with more than 21% reporting an annual income between $100,000-$150,000 and about 25% stating that their income was above $150,000. In terms of marital status, most were either married (46.7%) or never married (43.4%).

Measures

Table I. *Socio-demographic frequencies and percentages of sample (N=122)*

Variable	n	%
Born in the US	49	40.2
Years in the US		
0-5 years	13	14.1
6-15 years	13	14.1
16+ years	66	71.7
Religion		
Islam (all forms)	106	86.9
Christianity (all forms)	14	11.5
Non-religious	2	1.6
Sex		
Female	79	64.8
Male	41	33.6
Age		
18-29 years	68	55.7
30-44 years	27	22.1
45+ years	23	18.9
Highest Education Level		
High school/ GED	2	1.6
Some college	13	10.7
College graduate	47	38.5
Graduate degree	59	43.4
Marital Status		
Married	57	46.7
Living with significant other	2	1.6
Widowed/ Separated/ Divorced	8	6.6
Never Married	53	43.4
Annual Income (household)		
$15,000 or less	6	4.9
$15,000- $30,000	7	5.7
$30,000- $50,000	16	13.1
$50,000- $75,000	23	18.9
$75,000-$100,000	10	8.2
$100,000- $150,000	26	21.3
more than $150,000	31	25.4

Socio-demographic Characteristics

Participants were asked to indicate whether they were born in the United States and how many years they have lived in the United States. Respondents also answered questions identifying their religion, gender, age, highest educational degree attained, and marital status. Furthermore, information on employment status and household annual income were reported.

Health Risk Behaviors

The items on health risk behaviors included responses on tobacco and alcohol use. Specifically, respondents were asked if they currently (in the past 30 days) smoked any tobacco products, including cigarettes, hookah, regular pipe, or cigars. Furthermore, respondents were asked if they currently drink alcoholic beverages or if they consider themselves a “former drinker.”

Mental Health

The Center for Epidemiologic Studies-Depression Scale (CES-D) was used to assess the frequency of depressive symptoms [17]. The scale includes 20 items that list statements about depressive symptomology, measured on a 4-point Likert-type response scale of, “rarely or none of the time (less than 1 day)” (0) to, “all of the time (5-7 days)” (3). The possible range of scores was 0 to 60; with 0-15 indicating no depression, 16-26 representing signs of mild depression, and scores of 27 or higher indicating major depression.

Medical History and Health Measures

In order to assess medical history, respondents were asked if a health professional had ever informed them that they had depression, chronic headache, high cholesterol, hypertension or high blood pressure, heart disease or angina, stroke or mini-stroke, and diabetes (other than during pregnancy).

Health Access and Utilization

Items used to assess health access and utilization measured factors associated with the amount of time since they had last seen a health professional and the type of health care coverage they had. A question was included asking participants the last time they had seen a mental health professional as well.

Perceived Discrimination

The Every Day Discrimination Scale, used by the Midlife in the United States (MIDUS) study, was used for this sample of Arabs in the DC area. This scale is meant to measure unfair treatment on a minor, yet persistent, basis [18]. This was a 9-item Likert-type scale, using 4 points (never [1] to often [4]). Respondents were asked to report how often they perceive to be “treated with less courtesy than other people,” or if people act as “they are afraid of you.” The scale also assessed if respondents were ever called names, insulted, threatened, or harassed based on their ethnic background.

Acculturation

The Vancouver Index of Acculturation (VIA) was used to measure the mainstream and heritage dimensions of acculturation [19]. This scale is bi-dimensional, and thus includes two subscales—yielding both a heritage culture sub-score and a mainstream culture sub-score. This design was used since the acculturative process assumes identification with both heritage and mainstream cultural aspects, which are not mutually exclusive.

The statements were rated on a 5-point Likert-type scale, ranging from “strongly disagree” (1) to “strongly agree” (5). The higher the score, the more one identifies with mainstream American or Arab culture, on the respective sub-scales. The original scale utilized a 9-point Likert-type scale, however here it was reduced to a five-point scale based on a previous study on Arabs who tended to select the polar ends of scores [19,20]. This was concluded to be due to difficulty distinguishing subtle differences within the scale range [20].

Data Analysis

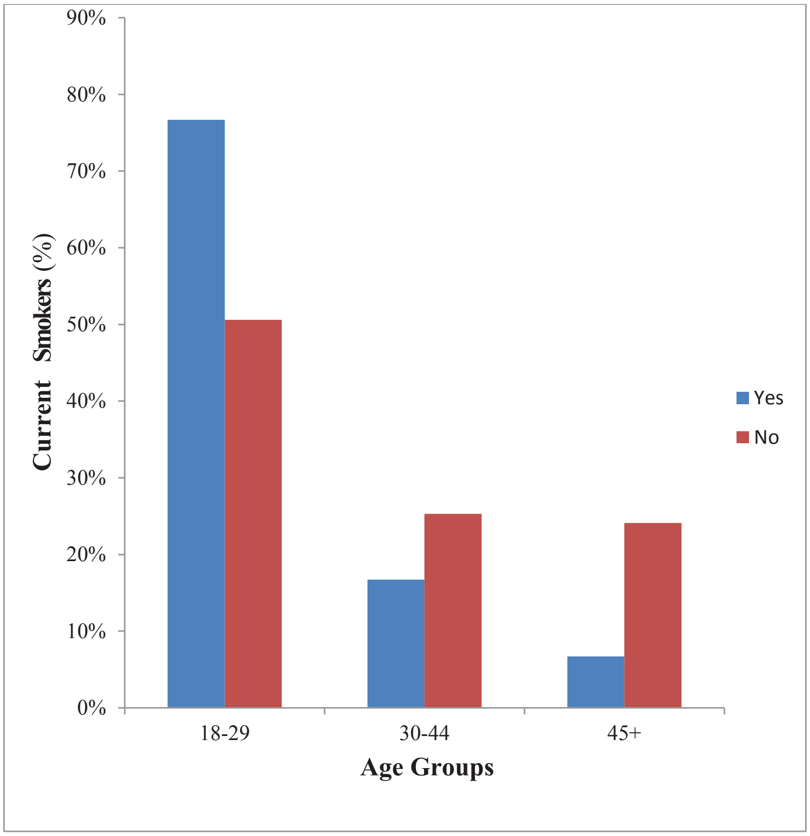
Bivariate analyses were used to explore the relationships between the variables in this study. Chi-square tests were used to analyze the relationships between socio-demographic characteristics, risk behaviors, and reported health issues, such as diabetes or hypertension. Analysis of Variance (ANOVA) tests were used to analyze the relationships between socio-demographic characteristics and depression, perceived discrimination, and acculturation. All of the data analysis was conducted using SPSS Version 20.

Results

Risk Behaviors, Health Access/utilization, and Medical History

Table 2 displays the number of responses and percentages on specific health risk behaviors, health insurance, and reported health issues. The two measured risk behaviors were current smoking and current drinking of alcoholic beverages, with about one-fourth of the sample engaging in both activities at 26.2% and 25.4%, respectively. There were no differences found between males and females with tobacco or alcohol use. Within the 25.4% of those who currently smoke, the 18-29 years age group reported a significantly higher smoking rate in relation to other age groups at 76.7% (χ^2= 6.83, p= 0.034), compared to 16.7% of those who smoke in the 30-44 age group and 6.7% in the 45 and older age group (Figure 1). The majority of respondents reported seeing a doctor or health professional in the past year or less (85.6%), while 14.4% said they had seen a doctor or health professional more than 1 year ago. However, only 9.3% of the sample reported seeing a mental health professional in the past year. Furthermore, 83.7% has either an HMO or PPO plan, and 8.2% had Medicaid or Medicare, and only 8.2% had no health insurance. Having health insurance was also positively correlated with income (F= 10.30, p= 0.002), educational level (F= 4.27, p=0.041), and years lived in the US (F= 7.05, p=0.008).

Figure 1. *Tobacco smoking rates across age groups, among those who smoke.*



Note: Significance level based on chi-square test, χ^2= 6.83, $p < 0.05$

In terms of self-reported health issues, as diagnosed by a medical professional, the highest rates were reported for high cholesterol (24%) and hypertension (11.5%). Data was also collected on depression (8.2%), migraine or chronic headache (10.7%), heart disease (1.6%), stroke or mini-stroke (0.8%), and diabetes (4.9%). Significantly more females reported to have migraines or chronic headaches than males (p=0.042). Whereas, significantly more men were told by a health professional to have hypertension than women (p=0.004). Moreover, diabetes was also associated with gender-- significantly more males reported having diabetes than females (p=0.017).

Table II. *Comparison of Health Risk Behaviors, Health Access/utilization, and Medical History among Males and Females*

Variable	Total %(n)	Male %(n)	Female %(n)
Health Risk Behaviors			
Currently Smoke	26.7 (32)	34.10 (14)	22.8 (18)
Currently Drink Alcohol	26.1 (31)	29.30 (12)	24.40 (19)
Last visit to health professional			
Less than 1 year ago	85.6 (83)	81.80 (27)	87.50 (56)
More than 1 year ago	14.4 (14)	18.2 (6)	12.5 (6)
Health Insurance			
None	8.2 (8)	6.1 (2)	9.2 (6)
PPO/HMO	84.7 (82)	84.8 (28)	83.1 (54)
Medicare/Medicaid	8.2 (8)	9.1 (3)	7.7 (5)
Health Issues (reported)			
Depression	9.4 (9)	12.1 (4)	7.9 (5)
Migraine/chronic headache*	12.5 (12)	3.0 (1)	17.5 (11)
High cholesterol***	24.0 (23)	45.5 (15)	12.7 (8)
Hypertension**	14.6 (14)	30.3 (10)	6.3 (4)
Heart disease	1.6 (2)	6.1 (2)	--
Stroke/ min-stroke	0.8 (1)	3.0 (1)	--
Diabetes*	6.2 (6)	15.2 (5)	1.6 (1)

Significant differences between males and females *=p<.05; **=p<.01; ***=p<.001

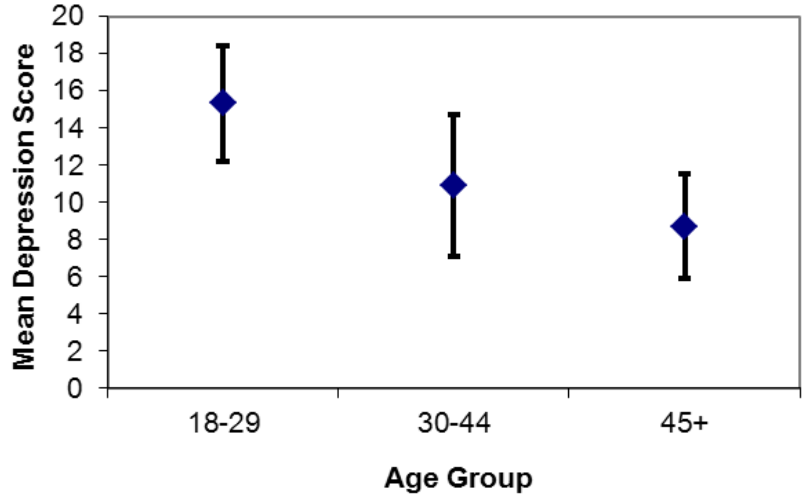
Mental Health

Cronbach's alpha was calculated for the CES-D scale for this sample (α= 0.87). The mean depression score for the sample was 13.03 (SD= 9.63) on the CES-D scale (Table 3), which is classified as having no depression. However, the overall rate of depression reported in the sample was 22.1%; with 13.1% categorized as having mild depression and 9% as having a form of major depression. Depression scores were significantly higher among females (M= 14.58, SD= 10.46) than males (M=9.5, SD= 6.52), based on responses to items on the CES-D scale (F=5.12, p=0.009). Figure 2 illustrates that the younger age group, aged 18-29, also scored significantly higher on the depression scale than the older age groups (F= 5.172, p=0.009). The mean depression score for the 18-29 years age group was 15.33, and ranged from 12.22 to 18.44. The mean depression score for the 30-44 years group was 10.90, with lower and upper scores of 7.07 and 14.74, respectively. For the 45 years and older age group, the depression score mean was the lowest (M=8.72), with a lower score of 5.89 and upper score of 11.55.

Table III. *Comparison of mean scale and indicator scores for male and female subsamples*

Scales and Indicators	**Male**		**Female**		**Total**	
	Mean	***SD***	***Mean***	***SD***	***Mean***	***SD***
Depression**	9.5	6.52	14.58	10.46	13.03	9.63
Acculturation						
Heritage Subscore	4.02	0.73	4.05	0.62	4.15	0.74
Mainstream Subscore	3.53	0.85	3.72	0.60	3.71	0.75
Discrimination	1.55	0.70	1.68	0.55	1.65	0.60

Figure 2. *Mean depression scores across age groups.*



Discrimination and Acculturation

Cronbach's alphas were determined for both the heritage subscale (α=0.83) and the mainstream subscale (α=0.84) on the VIA scale. The perceived Every Day Discrimination scale had an internal validity of α=0.92 for this sample. As seen in Table 3, the mean score on the Every Day Discrimination Scale was 1.65 (on a range of 1-4), indicating that overall, the sample reported mostly "never" or "rarely" experiencing feelings of perceived discrimination. However, perceived discrimination was positively correlated with depression, measured on the CES-D scale (F=6.02, p=0.004). Among those who reported "never" experiencing everyday discrimination, the mean depression score was 9.95, however within the group that reported "sometimes" experiencing discrimination, the mean depression score was 21.83—which is categorized as mild depression. Table 4 further presents the mean depression scores based on the overall reported daily frequency of perceived discrimination.

Table IV. *Depression means categorized by reported frequency of perceived everyday discrimination*

Experienced Everyday Discrimination	N	Depression Mean	Std. Deviation
Never	43	9.9535	7.73352
Rarely	33	14.697	9.03287
Sometimes	6	21.8333**	15.17124
Total	82	12.7317	9.44778

*Significant correlation between depression and perceived everyday discrimination **=p<.01*

Acculturation was measured according to the mainstream (M= 3.71, SD= 0.75) and heritage sub-scores (M= 4.15, SD= 0.74). Mean heritage sub-scores were significantly correlated with not having health insurance, with those that reported not having any form of health insurance reporting a higher heritage sub-score mean of 4.71 (F=4.53, p=0.036). However there were no other significant correlations associated with these subscales.

Discussion

This study explored the health needs of Arabs and Arab-Americans living in the DC metropolitan area, taking into consideration issues of acculturation and discrimination that can compound health status over time. Along with socio-demographic characteristics, it also examined health risk behaviors, depression, medical issues and history, health access and utilization, perceived discrimination, and acculturation. The aim was to examine the relationship between socio-demographics and health care access/utilization, risk behaviors, and health status among Arab-American adults living in the DC area; while also assessing the relationship between acculturation, discrimination, and health.

The results demonstrate that there is a clear link between smoking tobacco and the younger age group of 18-29 years. Previous studies have found high rates of tobacco smoking within the Arab community, however not much investigation had been conducted on the differing age groups [7]. Research has also shown that Arab men are more likely to be smokers than women [5]; however this study did not find differences in smoking behaviors between males and females. This may be due to more cultural acceptance of women smoking tobacco, particularly among the younger generation. There is also a prevalent social trend focused around smoking hookah or *sheesha*, with many young Arabs and Arab-Americans gathering and socializing at cafes that serve these tobacco products. These may be possible explanations for the high current smoking rates among this sample; however more information needs to be gathered to determine these correlations.

In terms of medical history, high rates of high cholesterol and hypertension were reported, but these percentages were not higher than national averages [21]. However, previous studies on Arab-Americans found higher rates of cardiovascular disease and cholesterol compared to national data [5,6,7]. These studies measured specific biomarkers and collected medical samples in order to obtain accurate measures [5,6,7]. This was not the case for this study, which gathered self-report data based on previous diagnoses. These responses could be limited to common issues with self-reported data; including recall bias, social desirability, or simply not knowing. Furthermore, the majority of the sample was relatively young, and development of cardiovascular issues or high cholesterol would most probably appear later in life. A study conducted in Detroit, found the range of diabetes among Arab-Americans (16- 33%) to be higher than rates among African-Americans (10%), Hispanics (11%), and non-Hispanic Whites (9%) [2,6]. The current study, based on self-report, found a reported rate of only 4.9%. Diabetes was found to be associated with the male gender, which has been the case in another study examining diabetes and acculturation among Arab-Americans [10]. A previous study found that men who immigrated at an older age, at an average of 34 +/- 10 years, were more likely to have diabetes, less likely to be employed, more likely to speak Arabic with friends, more likely to consume Arabic foods, and were less integrated into American society [10]. The current study however was not able to determine a correlation between diabetes and acculturation, based on the current sample size and prevalence of diabetes within the group. Men were also more likely to have hypertension and high cholesterol; whereas women experienced chronic headaches or migraines significantly more than men.

This research also found a similar prevalence of depression in the sample (22.1%) as a previous study conducted in metropolitan Detroit (23.2%) [11]. The rate of depression found among this sample is much higher than the national average of 5.3% [22]. Although various past studies found correlations between depression, acculturation, and immigration, the sample examined here did not exhibit any correlations between acculturation and depression. There was, however, a positive correlation between depression and discrimination in the sample examined. Further research needs to assess this relationship in more detail, and multivariate analysis should be conducted in order to understand the interaction between variables. Previous studies have also tested hypotheses of depression among Arab-Americans based on participants' country of origin [9,13]. Although data on country of origin was collected in this study, the subsample sizes for the countries reported were not large enough to conduct a cross-tabulation based on this factor. Other studies have found differences due to the fact that some immigrants or 2nd generation Arabs witnessed or experienced trauma or stress related to political, economic, or religious conflict-- depending on their country of origin. For example, a study on Iraqi refugees found significantly higher rates of depression among Iraqi immigrants, who at the time had experienced the Persian Gulf War, as compared to other Arab participants [13].

Given the high rates of depression reported, it is noteworthy that only 9.3% of the sample had seen a mental health professional in the past year. The only respondents who had seen a mental health professional were in the higher socio-economic groups and were more highly educated. However since the sub-sample sizes were small, these were not significant correlations. This is interesting since almost the entire sample had access to health insurance, which also covers most mental health related visits. This suggests that the barrier is not necessarily related to access, and more so to stigma or lack of knowledge on mental health. Typically, people of Arab descent are not willing to admit a psychological problem, which represents a sign of weakness [23]. There is also a wide mistrust of both mainstream and Arab mental health professionals [23].

Limitations

The sample is non-representative, since the majority of participants were young, of high socio-economic status, and well educated. The respondents were also mainly second generation or early immigrants, and were recruited through convenience sampling methods. A larger sample size is necessary to explore differences among Arabs of different countries of origin, as this can also show effects on mental health as well as acculturation. Comparing Christians and Muslims may have showed possible differences in acculturation or experienced discrimination. However, the subsample of Christians was not large enough to conduct these types of analyses. Using various scales that measure the same or similar constructs may have also been useful in order to detect the question-types that best suit this minority group—especially considering that scales from past research have typically been developed for African-American, Latino, or Asian populations. Furthermore, the sample had a larger group of females compared to males, and most participants were recruited from Virginia, as compared to the District or Maryland.

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Acculturation and Health in Michigan's Arab and Chaldean Populations

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Abstract

The aim of this study is to examine how Arab/Chaldean ethnicity and acculturation (measured as English language fluency) predicts the health behaviors (smoking, alcohol use, and exercise) and health status (cardio-vascular disease, diabetes, and obesity) of Arabs and Chaldeans. Because Arab and Chaldean ethnic identity is rarely measured in existing health datasets in the U.S., they are usually inseparable from the non-Hispanic White population in available health data, and therefore their health behaviors and outcomes as a group distinct from other people typically classified as "White" is not well understood.

To remedy this gap, we used data from the Behavior Risk Factor Surveillance Survey, which is a health survey conducted in the state of Michigan, a state in the U.S. with a large Arab and Chaldean population. In 2013 this survey included additional questions on Arab/Chaldean ethnicity and an oversample of Arabs. From these data we use comparative data on non-Arabs to assess how first and second generation Arab and Chaldean immigrants are faring in terms of their health. We also make comparisons within Arab/Chaldeans on English language fluency to test the effects of acculturation on health. We find that Arab/Chaldeans are less likely to exercise and are doing less aerobic exercise than non-Hispanic Whites. Arab/Chaldeans are also more likely to have used hookah than non-Hispanic Whites. However, Arab/Chaldeans have fewer incidence of binge drinking and lower likelihood of obesity compared to non-Hispanic Whites. Contrary to acculturation theory, Arab/Chaldeans who spoke English very well were more likely to have ever used hookah, were more likely to exercise, and had a lower likelihood of diabetes and coronary disease. These unexpected findings point to the possible unique character of Arabs and Chaldean, supporting the assertion that Arab and Chaldeans need to be studied separately from the non-Hispanic White population.

Introduction

Public health research in the United States has a rich literature on the health of many key minority populations. However, less is known about the health of Arab migrants and subsequent generations of Arab-Americans. The primary reason for this is that most epidemiologic studies in the U.S. do not classify Arab Americans as a minority population, and therefore their health data in nationally representative datasets is inseparable from White populations. Additionally, few studies include large enough numbers of Arabs or Chaldeans in their sampling in order to study Arabs as a separate category from Whites. Most data on the health of Arabs in the U.S. uses community samples (i.e. limited to a small geographic area), often focusing on Detroit, Michigan (Read, Amick & Donato 2004), which has the largest Arab population in the U.S. These studies indicate that Arabs have worse health than non-Hispanic Whites, with higher prevalence of smoking (Rice and Kulwicki, 1992; Islam and Johnson, 2003), hypertension (Hassoun, 1999), diabetes (Jaber, Slaughter, and Grunberger 1995), and obesity (Hatahet, Khosla, & Fungwe, 2002).

Health research focusing on immigrants generally finds a trend of foreign-born individuals exhibiting better health than native-born people, with the health of foreign-born people deteriorating as acculturation to the U.S. increases. Commonly referred to as the "immigrant health paradox" (Oppedal, Røysamb, & Heyerdahl 2004), this is a consistent pattern appearing most research, from the classic studies by Marmot and Symes (1976) and Baker, Hannah, &Baker (1986) to more recent studies such as Speciale and Regidor (2010). The immigrant health paradox is largely attributed to the less healthy lifestyles of Americans compared to immigrants, and as immigrants acculturate to an American lifestyle their health deteriorates. Acculturation can be defined in multiple ways. In anthropology and the social sciences, acculturation has been defined as "those phenomena which result when groups of individuals having different cultures come into continuous first hand contact, with subsequent changes in the original culture patterns of either or both groups" (Redfield, Linton, and Herskovitz 1936). Some of the dimensions of acculturation that can he measured include acquisition of the dominant language, maintenance of native language, and length of time in the receiving country. Certain cultural practices related to health may also be indicators of acculturation; for example, the use of hookah or narghile (water pipe) as a way to use tobacco is commonly practiced within Arab populations (Knishkowy and Amitai, 2005), and its continued use could be interpreted as a lack of acculturation.

However, Arab immigrants may be an exception to the immigrant health paradox. Abdulrahim and Baker (2009) found that Arab immigrants had worse self-reported health than U.S. born Arabs, and those that spoke Arabic reported worse health than those that spoke English. Read et al. (2005) found similar results, with Arab immigrants reporting worse health than U.S.-born Whites. However, some health behaviors and outcomes fit the immigrant health paradox theory, with English-speaking Arabs more likely to consume alcohol compared to non-English-speaking Arabs (Arfken, Broadbridge, Jamil, & Arnetz, 2014), and Arabs more attracted to American culture more likely to consume alcohol than Arabs who felt more connected to Arab culture (Jadalla and Lee, 2012).

One of the major shortcomings of existing research is the limited health and acculturation measures available from any given study. Our research remedies this shortcoming by using the Behavioral Risk Factor Surveillance Survey (BRFSS), which contains a large battery of questions on health behaviors and outcomes. For the 2013 sample our researchers worked with the agency administering the BRFSS, the Michigan Department of Community Health, to add supplementary questions measure culturally specific content and an oversample of Arabs and Chaldeans. Thus, we are able to investigate numerous health behaviors and outcomes and compare them to different measures of acculturation.

Objectives

Our larger project examines the intersection of cultural practices and beliefs with biology, examining the concept that greater acculturation is associated with poorer health due to: the adoption of sedentary lifestyle, the consumption of unhealthy foods, stress related to marginalization, discrimination, and social distance from home culture (and its protective effects). However, in this initial analysis, we only examined English fluency as a measure of acculturation.

The major hypotheses employed in the study to examine acculturation in the Arab and Chaldean American populations are:

1. Arabs and Chaldeans will have better health behaviors and health outcomes than non-Arab/Chaldean Whites, but will have higher levels of culturally specific negative health behaviors (i.e. hookah use).
2. Arab and Chaldean health behaviors and status will appear more like non-Arab and Chaldeans with greater acculturation, leading to less healthy behaviors and greater likelihoods of disease diagnoses and obesity. This relationship will persist after controlling for key demographics.

Methods

The Michigan BRFSS is a state-wide survey that collects data on a range of different health indicators. In 2013 it included an oversampling of 400 Arab/Chaldeans conducted in either English or Arabic. A list of Arabic surnames was created and was very successful in identifying appropriate respondents on a random digit sample of both landline and cell phone numbers in Michigan geographical areas. The oversample BRFSS was modified to include questions appropriate to this population, including Arab or Chaldean ethnic identity, country of birth, parents' country of birth, how long the person had been in the U.S., and whether or not the person spoke Arabic or English. The total number of Arab/Chaldeans including the oversample was 536. We combined these cases with the general 2013 MiBRFSS dataset (n=12,759) to determine whether there are significant differences between acculturation and health outcomes using Complex Samples descriptive and inferential statistics and logistic regression analyses in SPSS version 22.

We used Arab/Chaldean identity and English fluency to predict the following health behaviors: engaging in any exercise over the past 30 days, whether or not that exercise met aerobic recommendations, being a current smoking, ever using hookah, frequency of hookah use, and occasions of binge drinking over the past 30 days. For health outcomes we examined whether or not the person had been diagnosed with diabetes, cardiovascular disease or angina, and obesity. We controlled for sex, income, marital status, education, and age. The health questions were asked of all respondents, but the questions on English fluency, parents' birthplace, and time since immigration to the U.S. were only asked of the 400 cases in the Arab oversample.

Results

Tables 1.1 and 1.2 show the weighted distribution of variables from the combined general sample and Arab oversample. Table 1.1 shows the distribution of nominal and categorical variables, and Table 1.2 shows the distribution of continuous variables.

Table 1.1 Estimated frequency distribution of full sample, nominal and categorical variables

	Frequency (%)		S.E.
Race/Ethnicity			
Arab/Chaldean	1.7	±	0.1
White, non-Hispanic	76.4	±	0.6
Black, non-Hispanic	13.5	±	0.5
Hispanic	4.5	±	0.3
Other, non-Hispanic	3.9	±	0.3
Gender			
Men	48.3	±	0.6
Women	51.7	±	0.6
Income			
<$20,000	19.7	±	0.6
$20,000-34,999	22.1	±	0.5
$35,000-49,999	14.6	±	0.5
$50,000-74,999	16.8	±	0.5
>$75,000	26.8	±	0.6
Marital status			
Married	52.2	±	0.6
Never married, member unmarried couple	27.5	±	0.6
Divorced, Widowed, Separated	20.2	±	0.5
Educational Attainment			
< High School	12.0	±	0.5
High School Grad	30.6	±	0.5
Some College	34.3	±	0.6
College Grad	23.1	±	0.4
Any exercise in past month	75.5	±	0.5
Aerobic activity meets guidelines	53.0	±	0.6
Current smoker	21.3	±	0.5
Ever smoked hookah	13.6	±	0.6
Diagnosed with diabetes	10.5	±	0.3
Diagnosed with cardiovascular disease	5.3	±	0.2

Even with the relatively large Arab/Chaldean population in Michigan, they represent only an estimated 1.7% of the total population in Michigan. There were a relatively large proportion of people reporting some exercise in the past 30 days (75.5%), but only about two thirds of those people engaged in exercise that met aerobic recommendations. Just over 20% of respondents identified themselves as current smokers, with a smaller percent having ever used hookah. Just over 10% had been diagnosed with diabetes, and 5.3% had been diagnosed with cardiovascular disease. In the past 30 days respondents engaged in binge drinking an average of 1.5 times and smoked hookah an average of 1.4 times.

Table 1.2 Estimated mean distribution of full sample, continuous variables

	Mean		S.E.
Age	47.7	±	0.2
Days binge drank in past 30 days	1.5	±	0.1
Days smoked hookah in past 30 days	1.4	±	0.2

The distributions for the Arab/Chaldean oversample are depicted in Table 2. These distributions represent just the 400 cases in the oversample. Most people (71.2%) identified as Arab, with smaller proportions identifying as Chaldean (24.0%) or Arab and Chaldean (4.9%). The vast majority of respondents had foreign-born parents, with the largest proportions from Lebanon and Iraq. Almost half (43.6%) reported speaking English very well, and almost a quarter (24.1%) claimed to speak English not well or not at all. Just over a quarter (26.1%) were born in the U.S., and 54.4% had been in the U.S. at least 10 years. This indicates that the Arab and Chaldean population in Michigan is well established, although there are still some newly arrived migrants with 19.5% arriving just within the last 10 years.

Table 2 Estimated frequency distribution of Arab over-sample

	Frequency (%)		S.E.
Arab or Chaldean Identity			
Arab	71.2	±	4.0
Chaldean	24.0	±	3.9
Arab and Chaldean	4.9	±	1.4
Where Father Born			
United States	5.5	±	2.3
Lebanon	29.4	±	3.6
Iraq	36.2	±	4.3
Yemen	15.0	±	2.7
Other	14.0	±	3.8
Where Mother Born			
United States	8.7	±	3.4
Lebanon	25.0	±	2.7
Iraq	33.2	±	3.9
Yemen	15.2	±	2.7
Other	17.9	±	4.1
English Fluency			
Very well	43.6	±	4.4
Well	32.3	±	4.0
Not well or not at all	24.1	±	3.0
Immigrant Status and Duration			
Born in U.S.	26.1	±	4.2
Came within last 10 yrs	19.5	±	2.5
Came 11-20 yrs ago	28.2	±	3.4
Came more than 20 yrs ago	26.2	±	4.1

Table 3 displays the results of the cross-tabulations between race/ethnic identity and health outcomes. In these analysis we show the distribution across five different racial/ethnic identities (Arab/Chaldean, non-Hispanic Black, non-Hispanic White, Hispanic, and Other), but we only conducted tests of statistical significance on the difference between Arab/Chaldeans and non-Hispanic Whites. We found that Arab/Chaldeans were less likely to exercise than non-Hispanic Whites, and less likely to engage in exercise that met aerobic recommendations compared to non-Hispanic Whites. They were also much more likely to have a BMI that reached the threshold of obesity, and were more likely to use hookah compared to non-Hispanic Whites. There were no statistically significant differences between Arab/Chaldeans and non-Hispanic Whites on diagnoses of diabetes, coronary disease, or being a current smoker.

Table 3. Crosstabulations of racial/ethnic identification by health behaviors and outcomes (combined samples) – row percents reported

	Did any exercise in past 30 days*	Exercise met aerobic recommendations*	Diabetes	Coronary disease	Obese*	Current Smoker	Ever used hookah*
Arab/Chaldean *(%)*	68.8	37.0	11.3	5.6	50.5	18.6	38.1
NH White *(%)*	76.8	54.9	10.2	5.6	30.6	20.6	12.9
Black *(%)*	69.3	44.9	11.7	4.8	39.2	25.9	9.2
Hispanic *(%)*	77.1	50.6	8.3	4.1	20	22.8	17
Other *(%)*	74.1	51.8	11.1	2.8	33.3	19.1	17.7

* Arabs statistically different from NH Whites at 0.05 level

In the next set of Complex Samples bivariate logistic regression analyses we examine the relationship between English fluency and health behaviors and outcomes. For outcome variables we tested whether or not the person exercised in the past 30 days, if that exercise met aerobic recommendations, if the person was a current smoker, if the person had ever used hookah, and if the person had been diagnosed with diabetes, coronary disease, or obesity. There were no significant differences across levels of English fluency on exercise that met aerobic recommendations, obesity, or being a current smoker. However, we did find differences on doing any exercise, diabetes, coronary disease, obesity, and ever using hookah. Table 4 depicts these statistically significant relationships, using bivariate logistic regression with standardized beta coefficients.

These results in Table 4 run contrary to the immigrant health paradox, with greater English fluency associated with better health. Arabs and Chaldeans who report speaking English very well are more likely to have exercised in the last 30 days and are less likely to have diabetes or coronary disease than Arabs and Chaldeans that do not speak English well or at all. In support of our hypothesis that greater acculturation would lead to a lower likelihood of culturally specific bad health practices, Arabs and Chaldeans who speak English very well are less likely to use hookah than Arabs and Chaldeans who do not speak English well or at all.

Table 4. Logistic Regressions, English fluency predicting health behaviors and outcomes (standardized beta coefficients reported)

	Did any exercise in past 30 days				Diabetes				Coronary disease				Ever used hookah			
English fluency	*B*		SE		*B*		SE		*B*		SE		*B*		SE	
Very well	1.18	±	0.44	*	-1.93	±	0.54	*	-1.70	±	0.58	*	-1.40	±	0.35	*
Well	0.50	±	0.36		-1.27	±	0.43	*	-0.58	±	0.61		1.40	±	0.46	
Not well or not at all *(referent)*	-----				-----				-----				-----			
Intercept	-0.03	±	0.27		-0.91	±	0.34	*	-2.60	±	0.39	*	0.78	±	0.48	*

* Indicates statistical significance at 0.05 or greater

Table 5 depicts the Complex Samples multivariate general linear model using racial/ethnic identity to predict frequency of binge drinking and hookah use. Controlling for gender, education, income, age, and marital status, Arab/Chaldeans more frequently binge drink and use hookah than non-Hispanic Whites. This does not support part of our first hypothesis that Arabs and Chaldeans will have healthier behaviors that non-Hispanic Whites, but does support our hypothesis that Arabs and Chaldeans will have more culturally-specific bad health behaviors.

Table 5. General linear model using racial/ethnic identity to predict frequency of binge drinking and hookah use (standardized beta coefficients reported) **

	Occasions of Binge Drinking				Frequency of Hookah Use			
Race/Ethnicity	*B*		S.E.		*B*		S.E.	
Arab/Chaldean	1.29	±	0.28	*	1.29	±	0.28	*
Black	0.49	±	0.34		0.49	±	0.34	
Hispanic	1.49	±	0.50	*	1.49	±	0.50	*
Other	1.39	±	0.56	*	1.39	±	0.56	*
NH White *(referent)*	------				------			
Intercept	-0.86	±	0.33		-0.86	±	0.33	*

* Indicates statistical significance at 0.05 or greater

**All models control for gender, education, income, age, and marital status

In the final set of analyses, we tested the relationships between racial/ethnic identity and exercise (doing any exercise in the past 30 days and doing exercise that meets aerobic recommendations), diabetes, cardiovascular disease, obesity, currently smoking, and using hookah. We found that after controlling for the key demographics, only doing any exercise and using hookah was significantly associated with racial/ethnic identity. Table 6 shows the odds ratios of the likelihood of exercising and using hookah by racial/ethnic identity.

Table 6. Logistic regression model using racial/ethnic identity to predict the likelihood of exercising and hookah use (odds ratios reported) **

	Any Exercise				Ever Used Hookah			
Race/Ethnicity	OR		S.E.		OR		S.E.	
Arab/Chaldean	0.68	±	0.19	*	4.26	±	0.22	*
Black	0.71	±	0.21		0.53	±	0.30	*
Hispanic	0.91	±	0.25		0.92	±	0.30	*
Other	0.96	±	0.28		1.19	±	0.38	*
NH White *(referent)*	------				------			
Intercept	1.22	±	0.23	*	-1.62	±	0.31	*

* Indicates statistical significance at 0.05 or greater

**All models control for gender, education, income, age, and marital status

After controlling for demographics, Arab/Chaldeans are less likely to have done any exercise in the past 30 days, and much more likely to have ever used hookah. The odds of Arab/Chaldeans to have ever used hookah is over 4 times greater than for non-Hispanic Whites, while Arab/Chaldeans are about 32% less likely than non-Hispanic Whites to have exercised in the past 30 days.

Discussion

Results from the study appeared indicate that Arab and Chaldean in Michigan follow a similar pattern found among both community-based and nationally representative studies of Arabs in the U.S., in that they generally do not adhere to the immigrant health paradox. Their health behaviors and outcomes are often more poor than non-Hispanic Whites, and greater English proficiency sometimes leads to more healthy behaviors and outcomes. Most Arabs and Chaldeans reported speaking English well or very well, which is associated with higher rates of exercising and lower rates of diabetes, coronary disease, and hookah use. While Arabs and Chaldeans were less likely to exercise, less likely to do exercise that met aerobic recommendations, were more likely to be obese, and more likely to use hookah compared to non-Hispanic Whites in the bivariate logistic regression analyses, after controlling for age, gender, education, income, and marital status, only doing any exercise and hookah use remained statistically significant.

These findings challenge the immigrant health paradox and support the idea that Arabs and Chaldeans may be an exception to the trend of immigrants being healthier than U.S.-born Whites. The findings also highlight the importance of studying Arabs and Chaldeans as a separate group from non-Hispanic Whites. Further analysis is needed to study more measures of acculturation, as well as a more explicit examination of foreign-born status (particularly comparing first generation Arab/Chaldeans born in another country with the second generation who are U.S.-born with foreign-born parents). Additionally, there are other health outcomes available in the BRFSS data that we plan to use in order to further test how broadly the “Arab exception” to the immigrant health paradox can be applied.

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Emergent Voices of MENA American Youth: What They Are Saying

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Abstract

Individuals of Middle Eastern/North African (MENA) descent in the United States are represented by a population of approximately 3.5 million (Arab American Institute Foundation, 2015) including an increasingly high number of youth. Media and other mainstream resources accessed by today's youth chronicle population-relevant socio-political events in domestic as well as global contexts. In a post-9-11 era this includes lingering perspectives on the actual 9-11 tragedy as well as more current world events such as the Arab Spring. Thus, MENA American youth of today face a myriad of unique adversities such as stereotyping and profiling, often leading to microaggressions or other harmful acts of discrimination in their schools and communities (Nassar-McMillan, 2010). MENA populations globally have gained increasing attention both domestically as well as internationally, largely due domestically to the aftermath of the tragic events of "9-11" leading to the discrimination and profiling of MENA peoples, and internationally to the Arab Spring movements spanning the MENA geographic region. Moreover, youth of MENA ancestry are faced with navigating these global events regardless of their country of residence or specific ethnicity. Empirically based, culturally competent practices are needed in order to foster the resilience of this population and, in turn, to empower these youth to navigate effective identity development processes. The precursor to these effective intervention strategies in schools and communities is an accurate assessment of the issues these youth face, which likely serve as social determinants of their current and future health statuses. This paper presents a US-based, critical first step in gleaning the perspectives of this youthful population as well as the compelling need for creating a viable infrastructure on local/regional, national, and international levels in order to accurately assess experiences, issues, and needs among youth of MENA ancestry by building and fostering the capacity of schools and communities with Arab communities. A southeast Michigan-based focus groups study is overviewed, including methods, results, and discussions and implications for practice, policy, and future research.

Introduction

Project Background. In May of 2013, the University of Windsor, with financial support from the Society for Research in Child Development and the Social Sciences and Humanities Research Council of Canada, held an international symposium entitled Arab Youth: Developmental Pathways for Identity (University of Windsor, 2015; http://www1.uwindsor.ca/arabyouthsymp/). The keynotes and several other conferences sessions were facilitated by an internationally renowned scholar on acculturation issues, Dr. John W. Berry (Professor Emeritus from Queen's University in Kingston, Ontario). Other speakers and key conference attendees included scholars from around the world focused on issues of Arab youth (University of Windsor, 2015; http://www1.uwindsor.ca/arabyouthsymp/8/agenda-schedule). One of the outcomes of the symposium was the commitment to a project examining issues of Arab youth and identity development, spanning multiple countries both within and outside the Middle East/North Africa (MENA), with a primary emphasis on the Arab American youth in the US and Canada. One concrete strategy discussed for such a project is to develop a survey on youth of MENA ancestry that can be subsequently administered world-wide. Among the first steps in achieving this long-term goal is to develop and pilot such a survey instrument, with the plan of adapting the survey tool to cross-cultural MENA groups.

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Project Rationale. Individuals of Middle Eastern/North African (MENA) descent in the United States are represented by a population of approximately 3.5 million (Arab American Institute Foundation, including an increasingly high number of youth. Media and other mainstream resources accessed by today's youth chronicle population-relevant socio-political events in domestic as well as global contexts. In a post-9-11 era this includes lingering perspectives on the actual 9-11 tragedy as well as more current world events such as the Arab Spring. Taken together, MENA American youth of today face a myriad of unique adversities such as stereotyping and profiling, often leading to microaggressions or other harmful acts of discrimination in their schools and communities. Moreover, youth of MENA ancestry are faced with navigating these global events regardless of their country of residence or specific ethnicity. Empirically based, culturally competent practices are needed in order to foster the resilience of this population and, in turn, to empower these youth to navigate effective identity development processes. The precursor to these effective intervention strategies in schools and communities are an accurate assessment of the issues these youth face. The project described represents a critical first step in gleaning the perspectives of this youthful population as well as creating a viable infrastructure on local/regional, national, and international levels in order to accurately assess experiences, issues, and needs among youth of MENA ancestry.

Project Overview

The project described represents a 2014 initiative, funded by the Eastern Michigan University Michael G. Morris Endowed Chair (Eastern Michigan University, 2015; http://www.emich.edu/coe/morrischair/research.html) that (1) developed a protocol for faculty and students across Eastern Michigan to conduct focus groups for various interdisciplinary research endeavors in southeast Michigan area high schools, colleges, and universities; (2) provided training in focus groups based research methodology; (3) developed interdisciplinary research networks of MENA scholars in the Southeast Michigan/Windsor area; (4) provided opportunities for local area high school and college students to participate in focus groups exploring issues relevant to their identity development; and (5) finalized a pilot survey instrument for local, national, and international (i.e., cross-cultural) dissemination.

Moreover, this paper outlines the steps necessary in effective survey development as well as a framework for longer-term survey administration both in the US and Canada, along with establishing an infrastructure of research partners both within and outside the Middle East/North Africa regions.

Project Rationale

Individuals of Middle Eastern/North African (MENA) descent in the U.S. number approximately 3.5 million (Arab American Institute Foundation, 2015), including an increasingly high number of youth. Media and other mainstream resources chronicle population-relevant socio-political events in domestic as well as global contexts. In a post-9-11 era this includes lingering perspectives on the 9-11 tragedy as well as current events such as the Arab Spring. MENA American youth face a myriad of unique adversities such as stereotyping and profiling (Nassar-McMillan, Ajrouch, & Hakim-Larson, 2014; Nassar-McMillan, Hakim, & Patterson, 2014; Nassar-McMillan, Rezcallah, & Nour, 2014) often leading to harmful acts of discrimination in schools and communities (Nassar-McMillan, 2014; Nassar-McMillan, Nour, & Al-Qimlass, in press; Nassar-McMillan, Gonzalez, & Mohamed, 2014). Moreover, MENA populations have gained increasing attention both domestically as well as internationally, largely due domestically to the aftermath of the tragic events of "9-11" leading to the discrimination and profiling of MENA peoples, and internationally to the Arab Spring movements spanning the MENA geographic region. Thus, youth of MENA ancestry are faced with navigating these global events regardless of their country of residence or specific ethnicity. Empirically based, culturally competent practices are needed to foster the resilience of this population and to empower these youth to navigate effective identity development processes. Precursors to such intervention strategies in schools and communities are accurate assessments of the issues these youth face. Ypsilanti, Michigan, along with the Greater Detroit Metropolitan area, is home to one of the largest populations of youth of MENA descent in the US, and as such, represented a strategic location from which to spearhead such a wide-scale, international effort. The project described represents a critical first step in gleaning the perspectives of this youthful population as well as creating a viable infrastructure on local/regional, national, and international levels in order to accurately assess experiences, issues, and concomitant needs among youth of MENA ancestry globally.

Anticipated Project Outcomes

Eastern Michigan University awarded the Michael G. Morris Endowed Chair to the current researcher based on a long-standing record and body of scholarship on issues relevant to Arab Americans, including books, book chapters, journal articles, and training videos. As well, the EMU selection committee acknowledged the need for this area of research and the institutional commitment to build both internal (i.e., university) and community (i.e., southeast Michigan) capacity by developing this area of expertise and subsequent implications for practice, future research, and policy within schools, colleges, and communities both locally and state-wide.

In addition to the project objectives provided earlier, anticipated outcomes of the project included

(1) local/regional interdisciplinary collaborative network of researchers focused on Arab American youth issues in contemporary society;

(2) network of EMU faculty and students prepared to orchestrate all facets of focus group development and facilitation across an identified array of educational settings (i.e., high school, college, university);

(3) network of graduate students, ultimately with applied training on focus groups: including agenda-setting; recruiting and screening; facilitating and de-briefing; and analyzing data;

(4) regional group of adolescents and young adults spanning local high schools, colleges, and universities, self-identified as youth of Middle Eastern/North African (MENA) ancestry who have participated in focus groups exploring issues relevant to their identity development in contemporary schools and society;

(5) pilot survey instrument developed and normed on a US, southwest Michigan area based sample of MENA American youth, spanning high school and college ages;

(6) national network of potential survey administration sites;

(7) international network of researchers focused on MENA youth in contemporary society;

(8) range of prospective grant funding sources

Methods

Although each of the Project Objectives and Anticipated Outcomes were successfully accomplished, the remainder of this paper will focus on the research portions of the project. This Methods section will overview the preliminary research steps as well as the participants and procedures.

In keeping with survey development methodology, information was gathered from both the empirical and conceptual literature, including current relevant quantitative instruments (e.g., MultiEthnic Identity Measure (Phinney, 1992); Acculturation Rating Scale for Arab Americans (Barry, 2005), as well as content experts and other relevant stakeholders with the ultimate goal of a survey instrument and survey responses that identify or confirm (or, disconfirm) salient issues and lead to implications for further research. Initially, content experts from the International (Canadian) Symposium on Arab Youth identified key issues. The literature yielded key issues and research constructs/variables, as well. Finally, experts (identified through snowball and convenience sampling methods) in the southeast Michigan area were consulted via written surveys (disseminated and gathered via email) and subsequently invited to participate in an advisory board/Think Tank session hosted by Eastern Michigan University. Through this range of data sources, the following key constructs were identified for this research project: ethnic identity, acculturation, values/practices, life satisfaction/wellbeing, vicarious trauma, discrimination, peer pressure, self-identity, connectedness, substance abuse. The demographic variables determined to be salient in this study were: religious affiliation, gender, and generation level. Moreover, the predominant theories guiding this research process were Broffenbrenner's Ecological Model, Berry's Acculturation Theory, and Social Cognitive Theory.

Based on discussions within the Think Tank/advisory group meeting, it was determined that a 2-county study would yield the most illuminating results. Thus, we selected one county in the southeast Michigan area with a very dense concentration of Arab American youth, along with a second county with a slightly less dense concentration of Arab American youth. Within each county, we conducted two parallel sets of focus group interviews. In each county, we interviewed high school students; university students; and young adults not currently enrolled in university academic programs. Four of the groups were conducted face-to-face, while two others were conducted via the internet through a synchronous connection using GoToMeeting software. Two were conducted within a local community agency, two others were conducted on-site; one at a university; and one at a private/Islamic high school.

Research Questions

The research questions guiding this study were:

1. What are the key issues facing MENA American youth today?
2. What are their greatest challenges?
3. What are their greatest strengths/resources/resilience?
4. What kind of support do they need most?
   (from family; friends/peers; educators and other "helpers")
5. How do they identify themselves?

Instrumentation

The following focus group interview questions were formulated based on the theories, literature and expert sources, and methodologies identified previously. The protocol below denotes the primary 10 questions that were employed in each focus group, with corresponding prompts that were used to varying degrees to prompt additional or deeper discussion when needed.

1. How would you describe your everyday environment/s?
   (Probe topics: your home; school; other)
2. How would you describe your daily interactions?
   (Probe topics: with your family; your peers; others in your everyday environment)
3. What are your greatest sources of satisfaction/well-being/happiness?
4. What are your greatest sources of strength?
   (Probe topics: at home; at school; others)
5. What are your greatest challenges/distresses/stressors?
   (Probe topics: at home; at school; other places)
6. What are the solutions to your challenges/distresses/stressors?
   (Probe topics: at home; at school; other places)
7. What kind of support do you need the most?
   (Probe topics: at home; at school; other places)
8. How do you describe yourself "demographically"?
   (Probe topics: ethnicity; gender; religious affiliation; generation level; other)
9. What does it mean to be XYZ (above)?
   (Probe topics: use terms identified by group members; if not included, add "Arab American"; "MENA American"; "American"; others)
10. How do you fit in as an XYZ?
    (Probe topics: include "Arab American/MENA American"; "American"; others)

Procedures

The focus groups protocol and other relevant human subjects information was submitted to the primary researcher's university Institutional Review Board for approval. Focus group facilitators and participants were recruited through snowball and convenience sampling strategies. Six sites were identified and each institution's human subjects review protocol was reviewed and followed accordingly. At each site, a key host person was identified who recruited the actual participants using invitational information from the researcher. Participants, and in the cases of minor participants, their parents or guardians, were required to complete an Informed Consent form.

Each focus group took approximately 90 minutes. Both the face-to-face and on-line focus groups were audiotaped for later transcription purposes. Transcription was conducted by professional transcription service agency.

Data Analysis

We elected, based on an extensive literature review on qualitative/focus group interview methodologies and data analyses, to employ both Phenomenological (interpretative/hermeneutic approaches) (Saldana, 2009) and Grounded Theory (i.e., constant comparison; Strauss & Corbin, 1998) strategies to analyze the data. The Phenomenological approach involved Creswell's Lean Coding Strategy of selecting 5-6 initial codes based on literature reviews, previous research, experiences, and theory. The subsequent analytic (i.e., Phenomenological) strategy in this instance built around these initially identified codes. The results of that analysis are beyond the scope of this paper.

Alternatively and primarily, this study relied on a Grounded Theory approach, characterized by conducting an open-ended analysis with no pre-determined codes. We elected to employ a provisional approach (Cresswell, 2012) with elements of both Invivo and Initial coding.

Results

The Grounded Theory-based analysis yielded 12 key themes. Each of these is listed below, along with a corresponding direct quote to best illustrate the main content of each of the 12 themes.

Theme 1: Acculturation

- "The way I see that is when they say Arab-American, they don't want it as a melting pot, they want it as a-- they want you to keep your culture and your way of living, just live in the same area - rather than in melting pot and lose your culture, and be accustomed to someone else's culture."

Theme 2: Identity

- "When we're in overseas, we're American. When we're here, we're Arab"

Theme 3: Societal Values

- "It just shows that being involved really, really helps. Because if you just stick with yourself or the people that you came with from your high school, your not really going to branch out and meet any new people and have different dialogues."

Theme 4: Supports

- "I think my family, my religion and myself."

Theme 5: Role of Family

- "I feel like when I go home when my parents are proud of me, that makes me happy. I mostly do things to make my mom proud, because she's done a lot of sacrifices for our family. I feel like whatever I do at school or at work, I'm giving back to my mom. That makes me very satisfied."

Theme 6: Discrimination

- "In middle school, I knew a lot of the people who were in middle school from elementary school, but they still ended up treating me differently, because it wasn't like I was one of them anymore, I was the person with the headscarf. So I was-- sometimes it would get pulled off of me and stuff like that, and I would get called names. Even now, when I'm walking outside with my brother, I can still hear people saying like, "Terrorist," and stuff like that. It's a lot different than before."

Theme 7: Counteracting Stereotypes & Discrimination

- "I personally think on most things it's education. I think people need to learn about everything, like about the scarf, about the conflicts and educate themselves before they just automatically assume things. I think that that would be the biggest solution and that's also the hardest solution though too, because a lot of people don't want to learn or a lot of people think that they already know and they don't."

Theme 8: Accomplishments/Achievements

- "For me, because I do have big dreams that I really want to accomplish, the biggest stressful thought of it is that I won't be able to accomplish it."

Theme 9: Impacts of Community

- "It's probably a lot easier here in Michigan because there's a lot of Arabs here."

Theme 10: Religion

- "Trying to live up to the expectations put forth by my father and put forth by religion in general, like certain things conflict, such as adhering to the American society and adhering to certain aspects of the Islamic religion."

Theme 11: Social Networks

- "I don't really have any Arab friends. I have two Indian friends and Caucasian friends. I don't really have any Arab friends but they're all very aware that I'm Arab and they're very aware that I'm Palestinian."

Theme 12: Importance of Academics & Education

- "Education is a big thing, just making sure that you are able to support your kids so you don't struggle the way that they did - like my parents."

Discussion

For Arab American youth, these results point to the need for communication about their cultural issues and identify navigation processes. Youth should be able and encouraged to speak about their cultural heritage, along with similarities and differences, with others in their schools and communities. In cases where immigration or refugee populations are prevalent, or areas with other heightened elements of ethnic diversity, this dialog becomes even more critical to well-being and healthy biopsychosocial adjustment processes.

For teachers, counselors, psychologists, and other helping professionals in schools and communities, it is important to recognize the influence of family, religion, achievement, and academics on everyday life of Arab American/MENA American youth. Systemic practices and policies, as well, ought to take such considerations into account.

For policy-makers, it is critical to recognize the uniqueness of the profiling and discrimination facing this population of MENA American youth today. Ally movements must be developed and supported, to include "diversity dialogs" and other cross-culturally inclusive programs and policies. It is critical to recognize the values inherent in current Western-based policies employed in schools and communities across the US, and embrace the expansion of this value base to be more inclusive for youth whose families originate from collectively oriented cultures.

For scholars and researchers interested in MENA American youth, it is important to recognize that some/many currently existing quantitative instruments are not adequately normed on this population and would not readily capture its salient issues. Thus, mixed methods and additional qualitative approaches show the most promise, at present, for examining the relevant issues among this population as well as for developing effective cross-cultural collaborations.

As additional studies are conducted, it is important to continuously compare the results of the current study with newly emergent ones. In the US, a national survey would also continue to support the development and enhancement of both the current instrument/focus group protocol and the infrastructure for conducting the focus groups.

Additional implications for future research include the consideration of open ended questionnaires (versus quantitative instruments and scales); on-line focus groups to ensure accessibility for a wider range of participants; recruitment for 18-25 age groups to eliminate the need for parental consent; and the use of social media for recruitment purposes.

The transferability of the domestic Emergent Voices project to a global MENA audience involves exporting the research infrastructure, as per the specific directives from the May 2013 Canadian/International Symposium. The newly proposed project, Emergent Voices of MENA Youth, will develop (1) interdisciplinary research networks of MENA scholars and prospective research sites across the MENA region (2) protocols and corresponding focus groups training for interdisciplinary MENA project collaborators; (3) opportunities for MENA youth to participate in focus groups exploring identity development issues; (4) co-authored (with collaborator/ partners) project-based publications for research, practice, and policy audiences; and (5) specific funding sources to support further project expansion.

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Low back pain among nurses working in an Egyptian tertiary care hospital

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Abstract

Introduction

Low back pain is a major health threat and a main contributor to musculoskeletal disability worldwide. Nurses are one of the most prone professional workers to suffer from low back pain.

Objectives

To determine the prevalence and identify the risk factors of Low back pain among nurses working in an Egyptian tertiary care hospital and to assess the nurse's attitude regarding different situations causing low back pain.

Methods

A cross-sectional study was conducted at Ain shams University Hospital including 250 female nurses using a self-administered questionnaire

Results

Annual prevalence rate of low back pain was estimated as 80.4%. Age, marital status, Body Mass Index, years of experience, prolonged standing and moving beds or equipment were significantly associated with low back pain. A high positive attitude of nurses regarding LBP was reported, however, there was no statistically significant association between the occurrence of LBP and the nurses' attitude towards it.

Conclusion

Low back pain is multifactorial in origin that is influenced by personal and work-related factors including mechanical and organizational factors.

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Introduction

Low back pain (LBP) is a pain that occurs below the 12th Rib and above the gluteal folds [1]. It is the leading cause of musculoskeletal disability and the most frequently reported condition for people seeking physiotherapy [2]. Although it is not a life threatening condition, yet it constitutes a major health problem [3]. In most cases, it is accompanied by painful limitation of movement and may be associated with referred pain in addition to disabilities, absenteeism and considerable health cost [4].

Scientific data collected on the prevalence of LBP in the past years revealed a worldwide point prevalence of about 17%, an annual prevalence of 40-50% and a lifetime prevalence of 35-80% [5].

LBP is a well-recognized cause of morbidity among general population and in occupational settings [1]. Nurses are among the occupational groups that are vulnerable to LBP [6]. Various researches that stu died the prevalence of LBP among healthcare workers found that the highest prevalence rate was recorded among nursing staff (69%) [7].

An earlier research studied the impact of ergonomics on LBP. It showed that physical workload and patient-handling tasks as frequent bending or twisting and heavy lifting play an important role in the occurrence of LBP [8]. More recent researches have showed an association between work-related psychological and psychosocial factors and risks of LBP among nurses [9, 10]. An Egyptian study conducted on nurses at Mansoura University Hospital showed that work load and the lack of ergonomics within the working environment were associated with musculoskeletal disorders especially LBP [11].

Eriksen et al. (2004), in their study, used various measures to determine and to characterize LBP. These measures included the duration of pain and its severity in addition to some indicators of the consequences of LBP such as seeking health care and sick leave [12].

Occupational LBP in Egyptian nurses is poorly understood in terms of its frequency and risk factors. For this reason, the current study aims to determine the prevalence rate of LBP among nurse in an Egyptian tertiary care hospital, to identify associated risk factors and to assess the nurses' attitude regarding different situations causing LBP.

Participants and Methods

A cross sectional study was conducted at Ain Shams University Hospital, which is a teaching hospital and tertiary care center in Cairo, Egypt containing about 3000 beds. Owing to its location in the middle of Cairo, it serves over five million people and treats around 90,000 patients annually.

The study population included nurses working in Ain shams University Hospital. At the time of the study, there were 1474 nurses working in the hospital.

Assuming 95% confidence interval, 80% power of the test and 36.8% prevalence of work-related LBP among the study population [13], the sample size was estimated to be 250 nurses. Convenient sample was taken proportionately from different departments in Ain Shams University Hospital representing different job descriptions of nurses (Surgery, Internal Medicine, Obstetrics & Gynecology, Pediatrics and OPC).

A Self-administered questionnaire was used to collect information about socio-demographic and individual characteristics, occupational history, presence of possible risk factors of LBP, preventive measures, training on safe patient handling and a set of questions that denote attitude of nurses towards LBP.

Anthropometric measures were assessed; nurses were weighed using a digital scale and measured bare-footed standing as straight as possible without shoes against a wall using a fixed measuring stick to estimate the height.

Body mass index (BMI) was calculated as the individual's body weight (in Kg) divided by the square of her height (in meters). Nurses were considered to have normal BMI when it is equal to 18.5 to less than 25, overweight when it is 25 to less than 30 and obese when it is more than or equal to 30 [14].

Administrative approval was obtained from and confidentiality of data and results was ensured.

Data collected was revised and introduced to personal computer, statistical analysis was performed using SPSS program version 16. Data was statistically described in terms of frequency and percent in addition to mean and standard deviation for quantitative data. Univariate analysis was done to compare the effect of the different variables on LBP. A probability level of 0.05 or less was an indicator to statistical significance.

Logistic regression was used to identify independent risk factors for LBP. Probable risk factors were included in the regression model in reference to their significance level in the univariate analysis (P < 0.1). Likelihood ratio was compared in different models and the model yielding the highest ratio was selected. Testing goodness of fit was performed using Hosmer-Lemshow Chi-square. Predictability of the model was calculated.

Results

Regarding the Annual Prevalence Rate of LBP and its characteristics among nurses included in the sample (250 nurses), table 1 shows that 201 nurses (80.40%) reported pain in the back during the previous 12 months and that 174 (86.56%) of them reported radiation of pain to the leg or foot. One hundred and forty nurses (69.65%) suffered from LBP all the day round during the previous 12 month. Among those who reported LBP, the tasks with which difficulty was most commonly associated were standing, climbing stairs and walking (74.62%, 69.15% and 63.68% respectively). In 160 nurses (79.60%), the pain had interfered with normal work. A hundred and thirty three nurses (53.20%) reported that they had back pain before the last 12 month. Ninety nurses (44.77%) from those who suffered from LBP where absent from work because of their pain. The majority of nurses (70.40%) said that the manager does not accept LBP as a cause of absenteeism.

Regarding different preventive measures for LBP, table 2 shows that 209 nurses (83.6%) stated that there is no reporting channels for incidents of LBP as result of patient handling, 234 (93.6%) of them said that they do not use protective back belts during work and 222 nurse (88.80%) do not exercise to protect their back. One hundred and ninety six nurses (78.4%) reported that there is no non-lifting policy in their department. One hundred and seventy three (69.2%) of them stated that there is helping equipment for lifting and the majority of them (93.6%) know how to use it.

Regarding the training courses for safe patient handling and its application, results showed that the majority of nurses (80.40%) reported that they attended training regarding safe patient handling and also the majority (86.10%) of those who attended the training (201 nurse) applied it during their work (Table 2).

The mean score for nurses' attitude towards LBP was 79.24 ± 9.48 with no statistically significant difference between attitude of nurses suffering from LBP and those not suffering from LBP (figure 1).

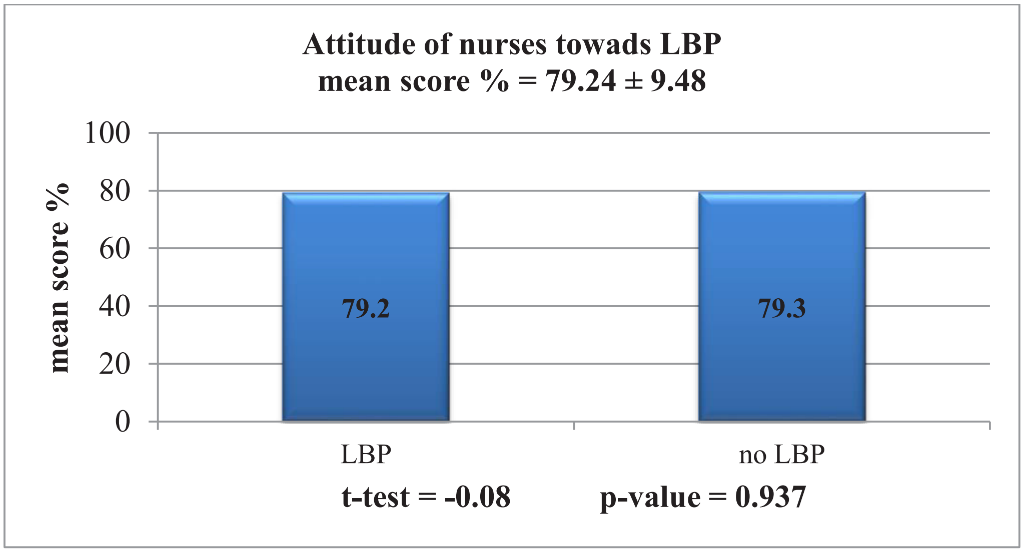

Figure 1: *Relation between the Attitude of Participating Nurses towards LBP and its Occurrence (N=250)*

Studying the association between LBP and individual characteristics of the participating nurses revealed that there were statistically significant associations between LBP and age (P<0.01), marital status (P<0.05) and BMI (P<0.05) (Table 3).

Regarding the association between LBP and the occupational history of the participating nurses, results revealed that LBP was more prevalent among nurses working in the surgical departments (surgery, obstetrics & gynecology) compared to those working in non-surgical departments (P<0.05) and that was significantly associated to the total working years in those departments. However, results revealed that the total number of years working as a nurse and the presence of dual work were not significantly associated with LBP (P > 0.05) (Table 3).

Table 4 demonstrates the association between LBP and the work done by the participating nurses during a single shift. The number of hours standing and moving beds or equipment were significantly associated with LBP (P < 0.01).

Logistic regression analysis for determination of the independent risk factors of LBP in the sample of nurses was illustrated in table 5. In Model 1, married and divorced, normal weight, surgical departments (surgery and obstetrics and gynecology), extra-work, and moving beds are the independent risk factors for LBP adjusted for age that was found significant at 25 years old. In Model 2, surgical departments (surgery and obstetrics and gynaecology), married and divorced, and moving beds are the only predictors of LBP among the investigated sample of nurses. The 2 models gave almost the same predictability.

Table 1: *Annual Prevalence Rate and characteristics of LBP among participating nurses*

Characteristics of LBP	Number	Percentage
Annual Prevalence Rate of LBP	201	80.40*
Number of attacks of LBP in the last 12 month		
once	28	13.93†
2 – 3	17	8.46†
4	16	7.96†
Most of the days along the month	140	69.65†
Pain in leg or foot due to LBP	174	86.56%†
Difficulty preforming the following activities		
Walking	128	63.68†
Sitting	51	25.37†
Standing	150	74.62†
Sleeping	67	33.33†
Getting dressed	63	31.34†
Climbing stairs	139	69.15†
Getting out of chair	110	54.72†
LBP interfering with normal work of nurses	160	79.60†
Suffering from LBP prior to last 12 month	133	53.20*
Absenteeism due to LBP	90	44.77†
Management acceptance of LBP as a reason for absenteeism	74	29.60*

* Percentage based on total sample of nurses (250 nurses)

† Percentage based on 201 nurses suffering from LBP

Table 2: *Preventive measures for LBP adopted by the participating nurses*

	Number	Percentage
Notification of incidents of LBP due to patient handling	41	16.4
Wearing back belt to protect back during work	16	6.4
Exercise to prevent or decrease LBP	28	11.2
Presence of non-lifting policy	54	21.6
Presence of helping equipment for lifting	173	69.2
Knowledge about using those equipment	162	93.6*
Attendance of training courses for safe patient handling	201	80.4
Application of skills gained in training	173	86.1†

* Percentage based on 173 nurses who admit to have helping equipment.

† Percentage is based on 201 nurses who took training.

Table 3: *Association between LBP and individual and occupational characteristics of participating nurses*

	LBP				X^2	P-value
	+ve		Total			
	n	%	n	%		
Age						
Less than 25	55	69.60	79	100	8.517	0.004†
25 or more	146	85.40	171	100		
Marital status						
single	47	69.10	68	100	8.863	0.031*
married	133	85.80	155	100		
widow	6	85.70	7	100		
divorced	15	75.00	20	100		
Number of children						
None	73	76.84	95	100	1.986	0 .370
1-2	83	84.70	98	100		
3-4	45	78.90	57	100		
BMI						
Normal (18.5 – < 25)	66	90.40	73	100	8.000	0.038*
Overweight (25–< 30)	67	72.83	92	100		
Obese (≥ 30)	68	80.00	85	100		
Departments						
Surgical departments	108	85.70	126	100	4.553	0.033*
Non-surgical departments	93	75.00	124	100		
Dual work						
Yes	66	85.71	77	100	1.994	0.158
No	135	78.03	173	100		
Total working years						
<11	105	77.80	135	100	2.571	0.277
11-	46	79.30	58	100		
≥21	50	87.70	57	100		
Working years in this department						
<5	73	73.00	100	100	5.792	0.016*
≥5	128	85.30	150	100		

* significant at < 0.05 level † significant at <0.01 level

Table 4: *Association between LBP and workload among the participating nurses during a single shift*

	LBP				**X^2**	**P-value**
	+ ve		**Total**			
	n	**%**	**n**	**%**		
Number of hours standing					21.171	0.0001*
None	0	0.00	5	100		
1-4	92	80.70	114	100		
5-12	109	83.20	131	100		
Number of hours sitting					0.853	0.653
None	23	76.70	30	100		
1-4	133	82.10	162	100		
5-12	45	77.60	58	100		
Number of patients helped						
• To sit					3.229	0.199
None	21	80.80	26	100		
1-10	148	78.30	189	100		
≥11	32	91.40	35	100		
• To stand					4.135	0.126
None	21	80.80	26	100		
1-10	139	77.70	179	100		
≥11	41	91.10	45	100		
• To use the bathroom					1.350	0.509
None	55	80.90	68	100		
≥1-10	113	78.50	144	100		
≥11	33	86.80	38	100		
Number of beds sort					4.773	0.092
None	10	90.90	11	100		
1-10	97	75.20	129	100		
≥11	94	88.20	110	100		
Beds or equipment moved					8.979	0.004*
Yes	175	83.70	209	100		
No	26	63.40	41	100		

*significant at < 0.01 level

Table 5: *Independent risk factors of LBP in the investigated sample of nurses*

	B	SE of B	Sig	OR (95% CI)
Model 1				
Age > 25 yrs	0.43	0.41	0.294	1.5 (0.7 – 3.4)
Married/Divorced	1.05	0.41	0.011	2.9 (1.3 – 6.5)
Normal BMI	1.79	0.52	0.001	6.0 (2.2 – 16.5)
Surgery/Obs and Gyn	0.79	0.37	0.034	2.2 (1.1 – 4.5)
Extrawork	0.85	0.45	0.060	2.3 (1.0 – 5.6)
Moving beds	1.71	0.46	0.000	5.5 (2.2 – 13.7)
Constant	-1.761	0.57		
Predictibility	82.4%			
Model 2				
Surgery/Obs and Gyn	0.761	0.35	0.032	2.1 (1.1 – 4.3)
Married/Divorced	1.208	0.35	0.001	3.3 (1.7 – 6.6)
Moving beds	1.124	0.40	0.005	3.1 (1.4 – 6.7)
Constant	-0.521	0.438		
Predictibility	81.2%			

Discussion

Two hundred and fifty nurses participated in the present study; the annual prevalence rate of LBP among them was estimated as 80.4%. This high prevalence rate is consistent with the results of several studies; Bos et al. (2007) and Karahan et al. (2009) showed a prevalence rate of LBP of 76% and 77.1% respectively [15, 16]. Other studies showed lower prevalence rates; in Tunisia, a study estimated 12 months prevalence rate of 51.1% [17]. Lower prevalence rate of LBP was also found in another study where the annual prevalence rate among healthcare personnel was 30%. The author attributed this low prevalence rate to the provision of training on manual handling and applying a non-lifting system [18].

Several indicators showed the severity of LBP among nurses in the current study, as 86.56% of those with LBP suffer from pain in leg or foot indicating nerve root irritation. Other indicators were limitation in daily activity and pain was interfering with standing, climbing stairs and walking respectively. About 44.7% of nurses were absent from work because of LBP compared to 36% of nurses in Nigerian hospital [19] and 26% in Tunisian study [17]. The majority of nurses (70.4%) stated that the management system does not accept LBP as a cause for absenteeism, thus nurses are required to work while suffering from LBP, putting more strain on their back and giving no time for recovery. This might explain the fact that the majority of nurses have pain continuously (69.65%).

What may under estimate the problem is the absence of a reporting system for incidents of LBP during work (83.6%). Documentation of incidents is important for qualification of the health problem.

Nelson and Baptiste (2006) showed that bad compliance is one of the main reasons for not using back belts as it might cause discomfort when wearing it at work [20]. Another study showed that back belts were not effective in reducing the occurrence of LBP [21]. This may explain why almost all of nurses in the present study do not use back belts for reduction of LBP.

Engkvist (2006) evaluated a “non lifting” program in Australian hospitals and reported a strong evidence that it improved LBP symptoms and sick leave among nurses [18]. The lack of a clear non-lifting policy within different departments, as reported by nurses in the present study, will put the nurses on the risk of the occurrence of LBP. The American Nurses Association (ANA) issued a position statement that supports actions and policies for elimination of manual patient lifting in order to promote a safe health care environment for nurses [22].

Lack of exercise among nurses at Ain Shams University Hospitals, as seen in the current study (88.8%), might be related to social, cultural and time factors that prevent a female nurse from practicing physical exercise. A study on Egyptian dental students showed an increase in LBP among those who do not practice physical exercise [23]. Long et al (2004) showed that physical exercise significantly and rapidly decreased pain and medication use and improve all other outcomes [24]. On the contrary, Dawson et al. (2007) stated that the type of exercises a nurse might perform on her free time or at home might not be effective because it may not be performed with the help of a professional trainer or due to improper practice [25].

By asking the participating nurses about training offered to them concerning proper patient handling, it was found that the majority of nurses attended such training and that they apply what was learned during their work. However, it appears that no skills had been gained from these programs as evidenced by the high prevalence rate of LBP among the participating nurses. This finding is supported by the results of Dawson et al (2007) who reviewed different studies and concluded that there is moderate evidence that manual handling training alone does not prevent back pain in nurses [25]. Moreover, Nelson and Baptiste (2006) stated that training may result in short term improvement of patient handling and lifting skills, but it has no impact in reducing musculoskeletal pain [20].

Despite of the high positive attitude of nurses regarding LBP, there was no statistically significant association between nurses' attitude and the occurrence of LBP. This indicates that reasons of LBP are beyond the control of the nurses themselves, it is rather the working environment that influences the occurrence of LBP. Accordingly, it can be deducted that the prevalence rate of LBP can be reduced only when improving the working environment.

Marital status was found to have significant relation to LBP. Married nurses were proved to have higher risk of developing LBP, this can be explained by the fact that nurses' duties towards their families as a wife or mother may be an additional risk factor for LBP when compared to single nurses. This finding confirms the results of a recent study conducted in Rwanda; it showed significant relationship between LBP and marital status [29]. Bejia et al. (2005) in their study showed that married nurses have higher prevalence of LBP [17]. Yet a Turkish study showed no significant association between marital status and LBP [28].

BMI showed significant association with LBP. Surprisingly was that nurses with normal BMI were more affected by LBP. A study conducted in KSA found that back pain was more prevalent among obese individuals [31]. On the other hand, Dundar et al (2010) in their study, showed that BMI was not significantly associated with LBP and that there is no significant relationship between height and weight and the occurrence of LBP [28]. Another study showed that workers with high BMI were not at a higher risk for developing LBP than workers with a normal BMI [32]. The cause of the current study results concerning BMI may be that overweight or obese nurses tend to do less work activity yet those who have normal BMI tends to be more active and applying more strain on their back adding more to LBP, however, this aspect requires more assessment.

Regarding the occupational history, it was found that there was significant association between the departments in which the nurses work and LBP. Nurses working at surgical departments (surgery department, obstetrics and gynecology department) were more frequently complaining of LBP than others. This could be explained by the nature of their work environment being more physically demanding than other departments. This was also reported in a Nigerian study [19]. There was also a statistically significant association between LBP and the total working years as a nurse, working more than five years in the same department was associated with higher prevalence of LBP. However, total nursing experience showed no statistically significant association with LBP, yet a trend was noticed as the number of nurses suffering from LBP increases as the total working years increase. Similar results were obtained by a study in Gaza that the risk for LBP increases with increasing working years, yet it was statistically insignificant [33]. Tinubu et al (2010) declared that nurses with more than 20 years of clinical experience are about 4 times more likely to be associated with LBP [34].

Work related risk factors of LBP were found to be associated with LBP where the prevalence of LBP increases with the increase of standing hours during a single shift. This is consistent with Aljeesh and Nawajha (2011), in their study, who stated that prolonged standing hours beside awkward postures for nurses in operating room are the main risk factor for LBP [33].

Patient handling is known to be one of the most common risk factors for LBP, yet it did not show a significant association with LBP in the present study, however, it showed a trend where the prevalence rate of LBP increases with the increase in the number of patients' helped to sit, stand or use the bathroom. This agrees with the results of Holtermannet al (2013) who stated that patient handling and transferring patients was ranked the most stressful task among nursing assistants [35]. Harrianto et al

(2009) showed that nurses with frequent manual handling practice had a higher risk for developing a point prevalence of LBP compared with nurses with infrequent manual handling practice [36].

High workload and the physical requirements in the nursing profession are challenging and play an important factor for developing LBP. Moving equipment and/or beds around during a typical nurse shift had a statistically significant association with LBP where the prevalence of LBP increase in nurses who moved more beds or equipment. The effort needed to perform such work, in addition to standing in awkward postures, bending and twisting, together with the pressure a heavy object, can put on the lower back of the nurse in continuous stress. This finding supports the results of a Malaysian study which revealed that lifting is an important insult to the lower back [37]. Other studies showed that lifting heavy objects was an important exposure associated with LBP [33, 38].

In the current study, LBP seems to be independently attributed to nature of work in surgical departments, being married or divorced and moving beds.

Regards the nature of work; moving beds and/or equipment showed to be significant risk factor thus proper lifting techniques and limiting beds movements during a nurses' typical shift can help in preventing LBP.

Conclusion

The prevalence of LBP among Egyptian nurses working in a tertiary care hospital is relatively high compared to worldwide reported figures. Marital status, working in surgical departments and work-related factors including moving beds and/or equipment were the risk factors for LBP. Working environment and lifting activities play a main role in the prevalence of LBP. Lack of incidents reporting system may under estimate the problem to the decision makers in the health facility.

Recommendations

- Health authorities should be more aware about the problem of LBP among nurses. Regarding the logistics; aiding equipment for movements of beds and equipment should be made available in every department.
- LBP prevention programs among nurses should focus on improving the working environment as regards limiting number of beds moved and developing a clear Non-lifting policy.
- Development of an effective reporting system for incidents of LBP is also very crucial.

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Road Traffic Accidents in Eastern Mediterranean Region: Pilot Systematic Review

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ABSTRACT

Introduction

Road traffic accidents (RTAs) are a major public health challenge across the World Health Organization's Eastern Mediterranean (EM) region, including nations of the Gulf Co-Operation Council (GCC). In addition to the adverse effects on health, considerable social and economic burdens are associated with RTAs. High mortality and morbidity rates in a young, potentially productive population entail not only the indirect and intangible costs associated with death and disability, but also the adverse psychological and economic impact on families experiencing such trauma. However, evidence-based studies that provide specific guidance for health policy changes to address RTAs and their adverse consequences for the public's health and safety within the GCC nations are relatively few.

Objective

This pilot systematic review identified, sampled, analyzed and synthesized current literature on RTAs in the EM region, specifically the GCC nations with the aims of: (i) presenting epidemiological studies of RTAs, (ii) describing interventions that show promise in reducing road traffic mortality and disability given the socio-cultural and political context of the Gulf region, and (iii) identifying gaps in research, public policy and regulation that deserve greater policy priority , public awareness and investment.

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Methods

An exhaustive systematic search was performed in OVID Medline, EMBASE, PsycINFO, Web of Science, and CABI Global Health. Search parameters included: (i) road traffic deaths and injuries, and (ii) nations in the EM region with an emphasis on the GCC. There were 313 articles that passed first phase of screening. A purposive sample of 25% for full text review (FTR) was drawn and coding distributed proportionately among the target databases. Two independent reviewers assessed a 20% subsample of these articles to test for reliability in coding and judgment as to relevance. Screening criteria, in addition to topical relevance, included: population-based studies, specific reference to the EM region, and publication no earlier than 2000. Review of the literature was limited to English language.

Results

We sampled 79 articles for FTR of which 43 did not satisfy inclusion criteria. The 36 included studies were broadly categorized as those assessing: (i) epidemiology of RTAs and identification of risk factors, (ii) trauma patients' clinical outcomes, including RTA-related, (iii) economic/health system cost and other nonclinical consequences of RTAs, (iv) modeling and advocacy of policies or instrument development, and (v) evaluating intervention or compliance with existing legislation and regulation. Most studies focused on GCC nations, with the highest frequency occurring in Saudi Arabia, Qatar, and United Arab Emirates. A majority of studies used data from hospital or traffic police records. Most commonly observed risk factors included: young male drivers, inconsistent traffic enforcement, excessive speed, and non-adherence to safety measures.

Conclusion

The sample of articles reviewed demonstrates the importance of RTAs as a public health challenge in the EM region, and specifically the GCC. The influence of demographic, economic and socio-cultural factors affecting road traffic safety justifies further epidemiologic studies and policy analyses. Few studies reported the effects of interventions in reducing RTAs, highlighting the need for evaluation research in this area to guide policy development.

INTRODUCTION

Road traffic accidents (RTAs) are a major global public health challenge, ranked as the 8th leading cause of worldwide mortality and the primary cause of death among adolescents and young adults, aged 15-29 years.[1] Specifically within the World Health Organization's (WHO) Eastern Mediterranean (EM) region, 10% of global deaths related to RTAs in 2010, approximately 1.24 million, were attributed to the 19 nations in the EM region.[2] Consequently, the road traffic mortality rate in the EM region is second only to Africa's death rate.[3] It is further notable that in distributing vehicular-related deaths on the basis of the WHO national income categories, the high-income nations of the EM have experienced a road traffic mortality rate double that of the global rate among high-income nations, 24.1 per 100,000 as compared to 8.7 per 100,000.[3]

Not only do the deaths and injuries associated with RTAs exact individual and family hardships in addition to insecurities and trauma upon the survivors and their communities, but these incidents also, in the aggregate, have both short-term and long-term adverse economic consequences.[4] As 60% of all road traffic fatalities in the EM region consist of individuals aged 15 to 44 years-old, which constitutes both an economically productive age cohort and represents the pool of emerging future leaders, considerable adverse implications exist for the continuing economic development, health and well-being of these nations.[1]

Fortunately, the WHO has made road traffic safety a global public health priority in response to a growing awareness of the need for strategic action to enhance road safety at the national and international levels culminating in a United Nations resolution 58/289.[5] This resolution resulted in the establishment of a Commission for Global Road Safety that led to the creation of a Global Plan for the Decade of Action for Road Safety, 2011-2020.[5] This plan established measurable objectives and activities organized around five strategic "pillars" or goals: road safety management, safer roads and mobility, safer vehicles, safer road users, and post-crash response. This document served as a clarion call for coordinated global action to prevent road traffic deaths, injuries and disabilities and as a template for evaluating national, regional and global progress in road safety improvement. Subsequent Global Status Reports on Road Safety published in 2009 and 2013 have indicated the extent of progress made in data collection, agency coordination, national legislation, local enforcement, driver and passenger safety measures and regulation to insure vehicular and road condition standards and regular inspection and increased public awareness and education.[6,7] In spite of the gains achieved, progress has been variable across nations and regions so considerable work in applied research, policy development and targeted interventions remains to achieve the broad goals of the Decade of Action.[5]

Purpose and Justification of the Study

This study is conceived as the first phase of a series of related studies focused on RTAs and their public health and economic implications for the Gulf region. The primary purpose of this study was to investigate the scope, focus and variability of the literature relevant to road traffic safety in the WHO EM region, with special focus on those nations included in the Gulf Cooperation Council (GCC), i.e., Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). These Gulf region nations have undergone dramatic economic and technological development during the past three decades, while maintaining political and cultural stability owing to the wealth generated by considerable petroleum reserves, policies of wealth distribution and social welfare, tight internal security, adroit foreign policy and the unifying effects of a common Arab culture and religion. The dramatic economic growth among these high-income nations has been reflected in the increased ownership of automobiles and related increases in total miles driven and road traffic fatalities and injuries including dangerous driving behavior, especially among youth. Religious, cultural and governance factors common to the Gulf region nations, their status as high-income nations and their relative political stability in the midst of the political and societal dislocations and conflict in the broader EM, justifies special focus on this sub-region relative to policy measures to enhance road traffic safety.

METHODS

This study is structured as a pilot systematic review of the published journal literature addressing relevant public health and economic aspects of RTAs in the WHO EM region. The pilot approach was chosen given the relative recency of this issue being recognized as a global public health priority and our uncertainty about the scope, foci, purposes and research designs and methods represented in the literature targeting this region. In effect, this study represents a rigorously implemented mini-systematic review that is most appropriate when an expanding body of literature is anticipated and the types of relevant literature are likely diverse, multi-disciplinary, and differ in purpose, rigor and methodology. Long[8] justifies a piloting approach, i.e., from strategic sampling through to synthesis, on the basis of research efficiency by allowing the researcher to adjust selection and data collection criteria based on the findings of the pilot and more efficient extraction, coding and synthesis of data when conducting the full systematic review.

Based on the findings of the pilot systematic review, the researchers intend to conduct a comprehensive systematic review on the population of articles already identified in the search strategy as Phase II of the extended study. The third phase will be to develop a set of policy analyses and recommendations in the form of policy briefs to inform and influence key policy makers in the Gulf region to implement legislative changes as needed and to mandate more effective enforcement of existing regulations and implement public awareness and health education campaigns to insure progress in road traffic safety by reducing the incidence of road traffic-related deaths, disabilities and injuries. A related follow-up study being considered is to investigate the state of RTA-related disability in these nations and the public health and economic consequences. It is anticipated that RTA-related disability is generally under-reported in the Gulf region and is a public health issue that deserves more epidemiological and policy-relevant research.

Search Strategy and Protocol

Studies were identified by searching the Ovid MEDLINE (1966- present), Embase.com (Embase 1974-present, MEDLINE 1966-present), CABI Global Health (1973- present), Web of Science (1945-present), Ovid PsycINFO (1806-present), and the Wiley Cochrane Library (Cochrane Database of Systematic Reviews, 1996-present, DARE 1994-present, CCRCT 1898-present). The search strategy included two concepts, the six Gulf nations and road traffic accidents, represented by both subject headings and text words as available in each database. The initial searches were completed on November 26, 2014. The complete search strategy for all databases is available with the corresponding author. Results were limited to publications from 2000- 2014, in English or Arabic. All results were imported into EndNote X7.0.2 and duplicates were removed using Bramer's method.[9] Further duplicates were removed on inspection by the research team.

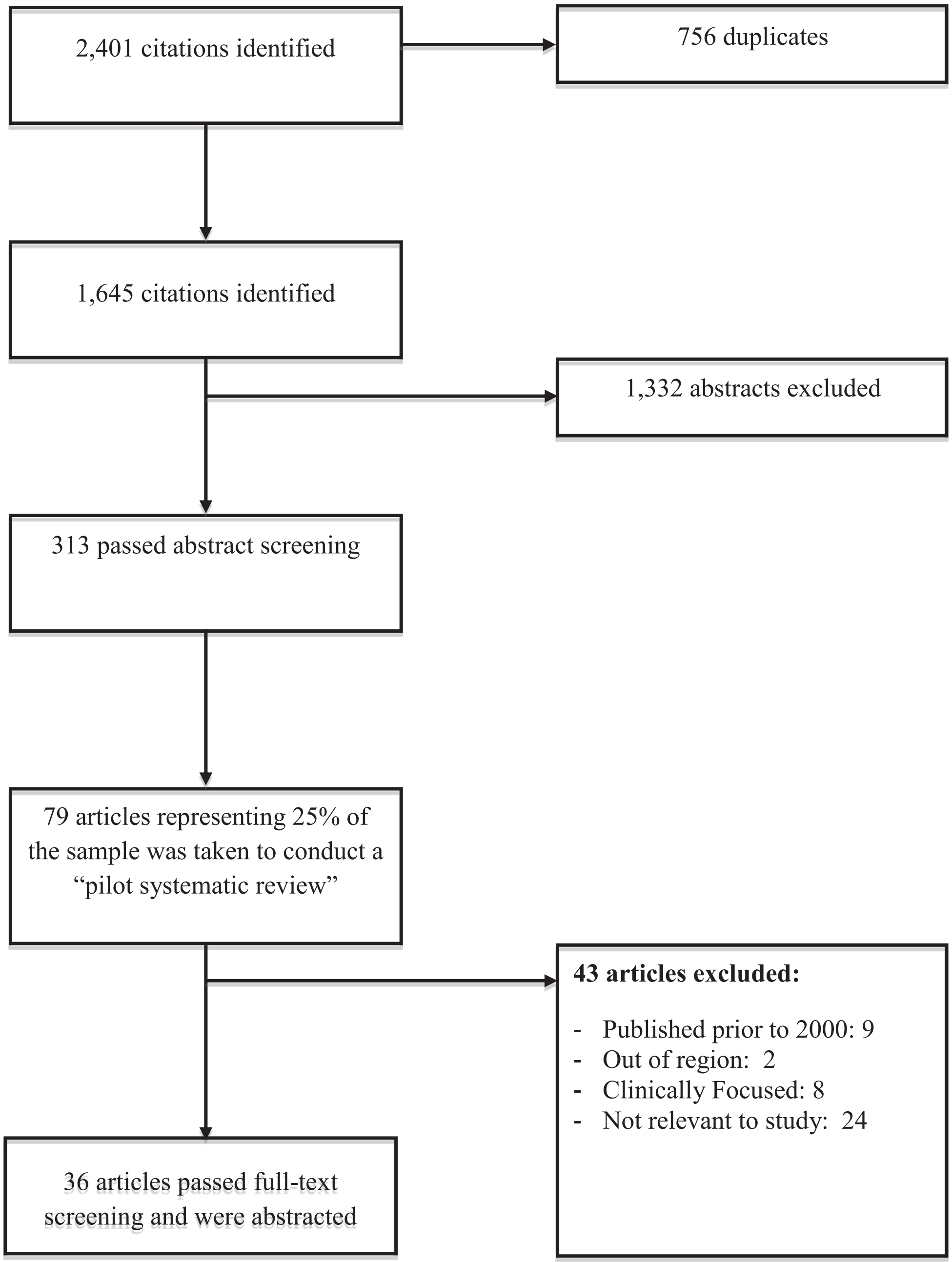
Sampling Strategy

With 2,401 initial citations identified, 756 were duplicates and removed from the body of abstracts to be evaluated. The 1,645 remaining citations underwent a title-abstract screening process of which studies not relevant to the research topic, studies not in the English language, and studies conducted outside of the EM region were excluded. The 313 relevant articles that passed first phase of title-abstract screening were varied in the nature of topics related to RTAs. Some of the common topics were: effect of interventions (ex. seat belt legislations) on road traffic injuries (RTIs), epidemiologic characteristics of RTIs, socio-cultural perceptions of driving, traffic safety assessments at intersections, effect of weather on RTIs, animal-vehicle collisions, socio-economic costs of traffic accidents, and more. Long's[8] systematic review pilot method was used to efficiently investigate the subtopics represented in the literature and refine the data collection and analysis processes in advance of the planned full review. A 25% sample of the literature was determined to constitute the pilot review, with all databases represented proportionally to the initial search. To increase the validity of the study, 20% of the included articles were peer-reviewed. These were also proportionally represented across databases. The process overview is depicted in Figure 1, and the distribution can be viewed in Table 1. Due to resource limitations, the pilot phase of this review was limited to English language articles only.

Table 1: *Literature distribution for pilot systematic review*

Database	N	%	S = 25%	20% Peer Review
OVID/MEDLINE	189	60.4	47	10
EMBASE	89	28.4	22	5
Web of Science	18	5.8	5	1
PsycINFO	11	3.5	3	0
CABI	6	1.9	2	0
Total	**313**	**100**	**79**	**16**

Figure 1: *Literature Flow Diagram*



RESULTS

Analysis

Analysis of the 36 articles sampled included distribution by nation in which the study was conducted or which served as a frame of reference; by the mode of travel addressed in the article; and by the study design. Of the nations within the pilot sample, 34 (94.4%) were the six GCC members. Within the GCC cluster 28 studies (72.2% of the total studies) were based in Saudi Arabia (10), Qatar (8), UAE (7), Qatar & UAE (1) (Table 2).

Distribution of the articles by mode of transportation involved: 23 (63.8%) specified as automobiles only; 10 (27.8%) were identified as involving automobiles, motorcycles, bicycles and pedestrians; and the remaining 3 (8.3%) focused only pedestrians or large animals, i.e., camels (Table 3). It should be noted that for a few studies that did not specify precisely the mode of transportation, automobile mode was inferred.

The study designs or alternative approaches as reported in the articles were classified as prospective, retrospective, hybrids (both prospective and retrospective), or as editorial and opinion pieces. The 16 retrospective studies represented the largest group, 44.4%, while the 15 prospective studies represented the second-largest group, 41.7%. Of the remaining five articles (13.9%), two were hybrid designs, i.e., analyzed data retrospectively and conducted surveys prospectively, and three were editorials or letters to the editor. Summaries were prepared from the texts of the sample of 36 articles selected for this pilot review. The lead author developed a tentative set of primary themes to be used as categories for classifying the articles to facilitate further analysis. This categorization scheme was validated by review of two other authors and the consensual scheme is as follows:

A. Epidemiology of RTAs and identification of risk factors
B. Trauma patients' clinical outcomes, including RTA-related
C. Economic/health system cost and other nonclinical consequences of RTAs
D. Modeling and advocacy of policy (e.g., traffic safety) or instrument development
E. Evaluating intervention or compliance with existing legislation and regulation

Each of the 36 articles was coded against this classification scheme based on what was perceived to be the primary focus of the article. It should been noted that although some articles clearly had multiple foci, purposes and themes, the authors decided against using a "hybrid" category for clarity of analysis. In addition to this coding by theme, a binary code was also applied to each article to indicate whether or not the authors proposed specific policy recommendations, i.e., "1" when such recommendations were offered and "2", when not. A recommendation of a generic nature, e.g., "efforts should be made to enhance road traffic safety," were counted as "no specific recommendation". Three other authors independently coded the articles using this scheme and any discrepancies were discussed and resolved by consensus. See Table 4 following for the final consensus mapping.

Table 2: *Literature Distribution, by Region*

	Eastern Mediterranean Region (EM)	Gulf Co-operation Council (GCC)	Saudi Arabia	United Arab Emirates (UAE)	Qatar	Kuwait	Bahrain	Oman	Qatar & UAE
Frequency Count	2	1	10	7	8	4	2	1	1

Table 3: *Literacy Distribution, by Mode of Accident*

	Automobile	Automobile/ Motorcycle/ Bicycle/ Pedestrian	Pedestrian only	Animal only
Frequency Count	23	10	2	1

Table 4: *Distribution of Mapping Result*

	Epidemiology of RTAs; Identification of Risk Factors		Trauma Patients' Clinical Outcomes, including RTA-related		Economic/health system cost and other consequences of RTAs		Modeling/advocacy policy or instrument development		Evaluating intervention or compliance with existing legislation and regulation	
	Specific Recommendation Provided	No Specific Recommendation Provided	Specific Recommendation Provided	No Specific Recommendation Provided	Specific Recommendation Provided	No Specific Recommendation Provided	Specific Recommendation Provided	No Specific Recommendation Provided	Specific Recommendation Provided	No Specific Recommendation Provided
Frequency Count	8	8	0	4	1	1	2	1	5	6

Abbreviation: RTAs- Road Traffic Accidents

The most prominent theme based on this mapping was the identification of risk factors and relevant epidemiological data associated with RTAs in this region, as 16 articles (44.4%) were so classified. This included studies using national data based on both public health registries and public safety reports. Just below half of these studies included specific policy and regulatory recommendations to enhance road traffic safety. The next largest group of articles was the 11 (30.6%) that included studies that evaluated road safety interventions and/or compliance with existing road traffic and safe driving policies and regulations. Of the remaining 9 articles, 4 (11.1%) focused on clinical outcomes of trauma patients, including those involving RTAs; 3 (8.3%) focused on modeling road safety policy or related measurement instruments; and 2 studies that addressed health system/ institutional cost implications. Of this sample 16 (44.4%) included specific recommendations for enhancing road traffic safety and or improved processes for more timely, accurate and comprehensive data capture of RTA-induced injury and mortality.

Although this sample of articles was selected intuitively to reflect the variability of themes across the total of 313 articles assessed as meeting the selection criterion of relevance, time frame of publication and geographical focus, i.e., the GCC nations, the authors cannot predict with confidence that this distribution of themes and recommendations will hold in the subsequent comprehensive systematic review using the same inclusion criteria.

Synthesis

The primary and undeniable finding from the review and analysis of the pilot study is that RTAs continue to be a major public health problem in the EM and the Gulf regions. The reports in the aggregate also serve as evidence of the heavy economic and societal burden imposed by RTAs and their consequences – on the families of those affected, the emergency response and trauma systems engaged and the short and long-term adverse effects on the national economy. Furthermore, this sampling of the relevant literature suggests that RTA-related deaths, injury and disability are very preventable, using proven technologies of highway construction, traffic regulation and enforcement and public health and safety awareness and education methods. For example, a common theme across several studies was the evidence of low compliance with seat-belt use and child constraints and the identification of excessive speeding as primary risk factors. Eleven articles identified excessive speeding as a risk factor for RTA-related death and injury and ten articles indicated that failure to use seat belts by drivers and passengers was another significant factor in spite of legislation requiring the use of these safety devices. Driving the wrong way, failure to observe traffic controls and avoidable distractions were also cited in at least one of the studies as a risk factor for RTA deaths and injuries. Although these behaviors may in part be explained by socio-cultural factors specific to the region, this does not justify the pattern of non-compliance in use of safety restraints, maintaining driving speeds at levels safe for the road and weather conditions and in general more prudent driving behavior. The fact that those studies which focused on identifying specific risk factors indicated that drivers of young age, i.e. adolescents and young adults, were associated with RTA deaths and injuries is telling but not surprising.

Another related finding is the apparently uneven enforcement of traffic regulations in terms of excessive speed relative to posted limits, the use of seat belts and child restraints and other illegal and unwise driving behavior. The true extent of the degree of non-enforcement is difficult to assess given that police records provide the primary source of data for violations of traffic safety regulations as well as vehicle and pedestrian accidents. Other identified risk factors in several articles included: the nationality of the driver, the gender of driver and passengers, and the location of RTAs, e.g., at intersections, divided highways, etc. It is notable that in one such study comparing Qatari, Jordanian, Filipino and Indian drivers, “Qatari drivers had the highest [driving] lapses, errors and violations.”[10] The effect of gender does not form a clear pattern among these studies but one UAE study of seat-belt usage reported lower compliance among women than men. One study addressed the use of cell phones while driving and the social norms affecting this behavior. The finding that 80% of the survey respondents reported frequently using cell phones while driving and that the majority were males and between the ages of 18-24 years (61%) raises concerns about the potentially adverse consequences of cell phone use and texting while driving among this cohort.[11]

Another major finding supported by several studies is the problem of under-reporting of RTAs and their consequences by the responsible public safety officers. Coupled with the fact that there appears to be little coordination of the reporting of RTAs by public safety agencies with public health registries and the medical records of the health care organizations providing trauma care suggests a distorted and likely incomplete view of the magnitude of this problem. It is notable that one of the major recommendations of the Global Plan of Action initiative of the Decade of Action for Road Safety is the “coordination of these multiple [road safety] efforts by a well-resourced [national] lead agency”.[12] Arguably the establishment of an effective coordinating agency at the national and [perhaps] GCC level may be essential for creating the political will for a serious and efficacious commitment to establishing road traffic safety as a top public health priority in this region. As the Global Status Report concludes, “there is a strong evidence base on what interventions work – government action is now the key to insure their implementation.” The findings of this pilot systematic review of the relevant literature in the past 15 years provides some evidence that supports this WHO conclusion and points to areas in which further research and policy action are needed.

Limitations

An important limitation of this study is that no attempt was made to assess either the methodological rigor of the research studies or measure their impact. However, both measures will be considered for the comprehensive systematic review (Phase II) to follow. Another significant limitation is to exclude the relevant literature in Arabic, which has been identified but not analyzed in the pilot phase due to staffing constraints. The “gray” literature, including popular media publications, blogs, newsletters, etc. written in both English and Arabic has also been intentionally excluded but will be sampled and analyzed in Phase II. It should be noted that among the articles initially identified by the search strategy but that were excluded from the analysis were clinical case studies of RTA patients and studies of clinical treatment protocols for RTA-related trauma. The selection of the articles in the pilot study likely under-sampled the relevant literature that focuses on “vulnerable road users” including pedestrian injuries and those involving bicycles and motorcycles. It is expected that these categories will be addressed in Phase II. A major obstacle faced by the researchers is the lack of external, dedicated funding to support the efforts of the research team.

CONCLUSIONS & RECOMMENDATIONS

Among the preliminary conclusions that can be drawn from this pilot study are the following:

- Considerable evidence has been established identifying the primary risk factors contributing to the incidence of RTA-related deaths and injuries in the Gulf region.
- The primary risk factors identified are those associated with driver, passenger and pedestrian behavior and traffic safety/policing deficiencies suggest that effective prevention requires both behavior change strategies and police reporting and enforcement system improvement.
- Although various studies have been conducted that address the epidemiology and root causes of RTA-related mortality and injuries in the region, few rigorous evaluation studies have been conducted to assess the effectiveness of road safety interventions
- Existing traffic regulation, norms and sanctions seem to have had little effect on risky driving behavior or compliance with driver and passenger constraints.
- Further study of the use of cell phones, texting and other distracting influences as risk factors for RTAs should be made a priority to guide policy development and effective regulation in this area.
- The evidence showing the effects of nationality and gender on driver behavior and RTA outcomes suggests that these factors merit further attention in research and policy formulation.
- Based on this pilot sample of literature no promising preventive strategies have been implemented or evaluated to mitigate the behavioral risk factors.

Broad recommendations for further research and health policy can be inferred from these observations, and we anticipate proposing more specific action plans based on our completion of Phase II to follow. However, it can be argued that the template for policy development and public action is provided in the WHO's Global Plan for the Decade of Action for Road Safety, 2011-2020.[5] The road safety activities detailed address the "five pillars" of a road traffic safety strategy including road safety management, safer roads and mobility, safer vehicles, safer road users and post-crash response. Based on the analysis of our pilot sampling of the relevant literature, it is anticipated that by translating the broad goals of more effective road safety management and safer driver and passenger practices into effective behavioral change interventions and more robust police reporting, apprehension and effective sanctioning of road traffic violations, the GCC nations will have made considerable progress in addressing this major public health challenge.

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Appendix A: *Assessment of overall study characteristics (n=36)*

Source	Region	Year of publication	Mode of Accident	Primary goal of study	Study design
Abbas[13]	Egypt	2004	Motorcycle/ Automobile	This study assessed indicators of traffic safety and tested mathematical models to predict accidents.	Retrospective study that used several sources of data which includes General Authority for Roads, Bridges and Land Transport, Egypt Academy for Scientific Research and Technology, and traffic police records.
Abu-Zidan et al[14]	UAE	2012	Automobile	The goal of this study was to assess impact of seat-belt compliance on RTIs.	Prospective study with data on accident statistics collected from patients being admitted to two major hospitals in Al-Ain (Abu Dhabi) from April 2006 to October 2007.
Al Ahmed et al[15]	UAE	2004	Motorcycle/ Automobile	This study assessed pattern of maxillo-facial injuries with respect to gender, age, and mechanisms of injury.	Retrospective study with data obtained from medical records and radiographs of patients admitted to Al Qassimi General Hospital Sharjah from 1999 to 2002.
Al-Ghamdi[16]	Saudi Arabia	2003	Motorcycle/ Automobile	This study assessed general characteristics of RTAs at intersection and non-intersection sites.	Retrospective study analyzing records of Riyadh Traffic Department for the years 1997 to 1998.
Al-Houqania at al[17]	UAE	2013	Automobile	The aim of this study was to assess statistics of RTCs caused by sleepiness and identify factors contributing to sleep-related collisions.	Prospective data collection from Road Traffic Collisions Injury Registry of Al-Ain City from April 2006 to October 2007.
Al-Shammari et al [18]	Saudi Arabia	2009	Pedestrian	This study analyzed characteristics of pedestrian accidents in Riyadh.	Retrospective study that used several sources of data which included: 1) traffic police reports, 2) hospital medical reports from Riyadh Central Hospital, Iman Hospital, and Prince Salman Hospital, 3) Riyadh Development Authority reports, 4) traffic police car yards, 5) Saudi Red Crescent Society reports.
Aldawood et al[19]	Saudi Arabia	2012	Automobile/ Motorcycle/ Pedestrian	This study assessed motor-vehicle related injury characteristics of patients admitted to a tertiary trauma care center in Riyadh.	Prospective study that gathered data on patients admitted to a trauma care center from September 1999 to December 2009.
Barss et al[20]	UAE	2008	Automobile	This study evaluated adherence to seat belt legislation by drivers, use of restraint by back seat passengers and children, and assessment of drivers' perceptions on use of safety restraint.	Prospective study that collected data at 5 (of 30) randomly selected petrol filling stations in Al-Ain city of Abu Dhabi from November 2003 to January 2004.
Bendak[21]	Saudi Arabia	2005	Automobile	This study had two aims: 1) to assess the degree of conformity with the seatbelt law introduced in two suburban areas of Riyadh few months after its implementation, and 2) to assess the impact of this legislation on pattern of injuries.	Prospective study that observed 600 drivers and 300 front seat passengers randomly chosen from two different suburbs in Riyadh. Data for second part of the study assessing accident statistics was obtained from Riyadh Central Hospital.

Appendix A: Assessment of overall study characteristics (n=36), continued

Source	**Region**	**Year of publication**	**Mode of Accident**	**Primary goal of study**	**Study design**
Bener et al [10]	Qatar	2011	Automobile	This aim of this study was to assess driver behavior among four ethnic groups: Qataris, Jordanians, Indians, and Filipinos and to evaluate the associations between driver behavior and accidents.	Prospective study that identified patients visiting 21 primary health care centers. These patients were randomly selected through multistage stratified sampling. From January 2012 to September 2012, 2400 drivers participated in the study.
Bener et al [22]	Qatar	2011	Automobile/ Motorcycle/ Pedestrian	This study analyzed causes of mortality in Qatari children.	Retrospective study with data analyzed from Death Certificate Registry of the Preventive Medicine of National Health Authority, Qatar from January 1, 1993 to December 31, 2007.
Bener et al[23]	Qatar	2010	Automobile/ Motorcycle/ Pedestrian	This study assessed causes and distribution of traumatic brain injuries in the Qatari population.	Retrospective study with data analyzed from Accident and Emergency Department of the Hamad General Hospital and eight other Trauma Centers of the Hamad Medical Corporation from January 2003 to December 2007.
Bener et al[24]	Qatar & UAE	2008	Automobile/ Motorcycle/ Pedestrian	This study assessed factor structure of the Manchester Driver Behavior Questionnaire (DBQ) and compared the DBQ scores between Qatar and UAE.	Prospective data collection was performed in these two countries: a) Qatar –a multi-stage stratified cluster sampling was used to identify 1110 patients registered at 21 primary health care centers from October 2004 to March 2005. The DBQ was administered by qualified nurses and health educators, and b) UAE - a multi-stage stratified cluster sampling design was used to identify respondents arriving for renewal of car registration from three cities, of which 1800 respondents formed the study sample for this country.
Crankson [25]	Saudi Arabia	2006	Automobile/ Motorcycle/ Pedestrian	This study evaluated motor-vehicle injury characteristics among children.	Retrospective analysis of medical charts of children admitted to King Fahad National Guard Hospital, Riyadh. Data were analyzed for ten years from January 1994 to December 2003.
El-Sadig et al[26]	UAE	2004	Automobile	This study aimed to assess impact of seat-belt compliance on road traffic injuries.	Retrospective analysis of medical charts of individuals involved in MVCs and taken to Al-Ain Hospital pre and post the implementation of the seatbelt legislation. The records in the pre-analysis period were analyzed from 18 January to 30 June 1998 while records from 2 February to 3 August 2000 were analyzed in the post-implementation period.
El-Sadig et al[27]	UAE	2002	Automobile/ Motorcycle/ Pedestrian	The goal of this study was to evaluate epidemiologic characteristics such as morbidity and mortality of RTAs in UAE from 1977-98.	Retrospective analysis of Ministry of Interior's Annual Report from 1977–1998.
Hassan et al [28]	UAE	2012	Automobile	The purpose of this article was to investigate traffic safety in UAE using a holistic perspective approach, and to identify the main factors contributing to traffic safety.	Both primary and secondary data methods were used. Surveys were conducted to assess road users' perceptions of traffic safety while interviews of traffic police departments, transport authorities and health authorities were conducted to assess their respective contribution to road traffic safety. Official police reports were analyzed to measure mortalities and injuries due to RTIs.

Appendix A: Assessment of overall study characteristics (n=36), continued

Source	**Region**	**Year of publication**	**Mode of Accident**	**Primary goal of study**	**Study design**
Mamtani et al[29]	Qatar	2012	Automobile	The purpose of this article was to evaluate the rate of traffic injury rates in Qatar from 2000-2010. Specifically, the study evaluated the rate of injury before speed control cameras were installed in 2007 and compared them to the rates of injuries after the camera installation.	Retrospective study that used several sources of data including official traffic department reports, yearly data from the Qatar Supreme Council of Health, reports by the Health Information Section of the Supreme Council of Health, and the department of the Ministry of Interior.
Riquelme et al.[11]	Kuwait	2010	Automobile	The purpose of this article was to measure the influence of different norms of talking on a cell phone while driving; specifically the social influences that have been neglected in previous research.	Prospective study that gathered data from college and part-time post graduate students regarding injunctive, subjective, verbal, and behavioral norms related to use of mobile phones while driving.
Al-Azri and Al-Maniri[30]	Oman	2011	Automobile	This letter to the editor addressed how simply changing a law wouldn't solve the issues concerning traffic accidents in the region unless a cultural change was implemented.	Editorial
Barrimah et al[31]	Saudi Arabia	2012	Automobile	The purpose of the article was to examine the consistency of health system and police records with respect to RTIs, assess risk factors of RTIs, and compare pattern of accidents in Qassim area of Saudi Arabia with those in other areas of Saudi Arabia.	Both primary and secondary data methods were used. The retrospective analysis used data from several sources including: hospital records from the major hospitals in Qassim region in 2010, traffic police department reports, and data from outpatient hospital clinics. A survey questionnaire was also designed and used to gather RTI-related information from patients attending primary health and outpatient clinics.
Darwish et al[32]	Saudi Arabia	2014	Automobile	The purpose of this article was to study the life styles of Saudi children (1-5 years of age).	Cross-sectional study that gathered data on lifestyles and socio-demographics of Saudi children and their parents/ caregivers. Questions regarding use of seat-belts were asked.
Al Shimemeri, and Arabi[3]3	Saudi Arabia	2012	Animal	The purpose of this article was to the study the impact of large animals - specifically camels - on RTAs and offer potential solutions to reduce morbidity and mortality rates.	Narrative Report
Alani et al[34]	Qatar	2012	Motorcycle/ Bicycle	The goal of this study was to identify patterns of injury and prevalence of use of protective equipment in drivers using all-terrain vehicles.	Prospective study that gathered data on injury mechanisms, location of incident, experiences of drivers, use of protective equipment, impairments and deaths.

Appendix A: Assessment of overall study characteristics (n=36), continued

Source	**Region**	**Year of publication**	**Mode of Accident**	**Primary goal of study**	**Study design**
Alghnam et al [35]	Saudi Arabia	2014	Automobile	This study developed and validated a model to predict in-hospital death among patients admitted to a large-urban trauma center in Saudi Arabia for treatment following traffic-related crashes.	Retrospective study that used data from trauma registry of patients admitted to the emergency department (January 2001-December 2010) of King Abdulaziz Medical City, Riyadh.
Bener et al[36]	Qatar	2012	Automobile	The objective of this study was to determine the trends in the number, incidence and pattern of injuries in the State of Qatar.	Retrospective study that used data from 53,366 patients with RTIs admitted to emergency medical centers of Hamad Medical Corporation during 2006-2010.
Hamza et al[37]	Bahrain	2003	Automobile	The goal of this study was to determine the incidence of RTAs and associated casualties in Salmaniya medical complex.	Retrospective study that analyzed medical records of RTA-related admissions at SMC from January 1, 1996 to December 31, 2001.
Malki [38]	Bahrain	2002	Automobile	This article is an editorial and provides statistics on RTAs in Bahrain in 2000 and 2001.	Editorial
Al-Abdeen Tana [39]	Saudi Arabia	2007	Automobile	This main objective of this study was to assess prevalence of self-reported risk taking behaviors among intermediate and secondary male students and their teachers in the region of Al khobar, Saudi Arabia.	Cross-sectional study that gathered information on smoking behaviors, physical activity, use of seat belt, and demographic characteristics.
Vafaee-Najar et al[40]	EM (Iran)	2011	Automobile	The goal of this study was to identify risk factors of RTIs in the Iranian City of Mahshad from June to November 2007.	Case-control study where cases where the drivers who were interviewed at the location of the accident or upon arriving to the hospital, while controls were drivers who had history of accidents but did not experience any injuries.
Bener et al[41]	Qatar	2008	Automobile	The aim of the present study was to examine the impact of four-wheel drive on risky driver behaviors and road traffic accidents in Qatar.	Cross-sectional study that gathered data from 1110 Qatari drivers attending primary health care centers from October 2004 to March 2005. The Driver-Behavior Questionnaire was used.
Bener et al[42]	Qatar	2009	Automobile	This study determines the characteristics of RTIs among Qatari drivers and examines the human behavioral and environmental risk factors associated with the occurrence of RTIs.	Cross-sectional study that gathered data from 1406 Qatari drivers attending primary health care centers from January to June 2009. Questionnaire was designed to measure the following: socio-demographics, driving history, information on type of vehicle, injury characteristics and driving-related behavioral risk factors.

Appendix A: Assessment of overall study characteristics (n=36), continued

Source	**Region**	**Year of publication**	**Mode of Accident**	**Primary goal of study**	**Study design**
Bener et al[43]	GCC	2003	Automobile	The aim of this article was to review the road safety situation from 1988 to1998 in developed and developing countries compared with the Arabian Gulf countries and suggest strategies to improve it.	Retrospective study that used data from several sources including: Directorate of Traffic and Ministry of Health records in Gulf Countries, World Health Organizations Statistics Annuals, International Road Federation, Transport Road Research Laboratory and accident facts publications.
Al-Harbi et al[44]	Kuwait	2012	Automobile	This paper investigated the impact of meteorological conditions on traffic accidents in Kuwait. Stochastic models are developed to analyze and examine the influence of meteorological conditions on the level of road accidents from March 2009 to March 2010.	Retrospective study that used data several sources of data including: daily weather data obtained from weather stations at Kuwait International Airport and accident data obtained from Kuwaiti Ministry of Traffic.
Al-Saleh and Koushki[45]	Kuwait	2007	Automobile	This research was undertaken to assess contemporary trends in driver infractions of traffic rules and regulations, in general, and the influence of driver use of mobile telephones while in motion.	Prospective study that collected data on road traffic infractions such as high/low travel speeds, running a red light, seat belt use, mobile phone use and other demographic information.
Koushki and Ali[46]	Kuwait	2003	Pedestrian	The aim of this article was to review the safety of pedestrians as road users in both industrialized and non-industrialized nations, while also comparing pedestrian injuries and deaths in Kuwait over 1996 to 1998.	Retrospective data that analyzed records of General Traffic Department of Kuwait's Ministry of Interior from 1996 to 1998.
Abbreviations: EM-Eastern Mediterranean, GCC-Gulf Co-operation Council, MVCs-Motor Vehicle Collisions, RTAs-Road Traffic Accidents, RTIs-Road Traffic Injuries, UAE-United Arab Emirates.					

Challenges in Gynecological Oncology Training and Care

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Gynecologic cancers represent a significant health problem for women around the world. Endometrial, ovarian and cervical cancers account for a significant number of cancer-related deaths globally. The relative frequencies of these different malignancies vary among different countries depending on demographics and social factors. Developing countries face a special problem, as it pertains to gynecologic cancers, related to the limited resources and clinical expertise to manage these life-threatening diseases.

When it comes to medical expertize, the training for treating gynecologic cancers has significantly evolved over the past 3 decades. In the western world, there has been a move toward specialized training in gynecologic oncology that has usually followed the general training in Obstetrics & Gynecology. Such training does not exit in many developing countries as there is paucity of expertize and financial resources to carry those educational activities. Online curricula, ‘teaching missions’ to middle and low resource settings as well as international scholarships for young physicians may help address some of these deficiencies. Advances in technology can further help with access to expertise that does not exist locally. Telemedicine, including tele-radiology and tele-pathology, allows the outreach of expertise and development of virtual tumor boards beyond geographic boundaries. These can also be deployed at reasonable costs that are a fraction of the funds needed to build these on site.

Cancer care is quite costly. Whether it is surgery, critical care, drug treatment or radiation therapy, these modalities come with high price tag and can rapidly consume healthcare budgets. Even in the richest settings, such comprehensive treatments cannot be financed by the individual patients. Third party payers, including governmental health coverage, are often needed to subsidize the cost of those treatments. This makes it imperative that governments set strategic population-based goals based on the prevalence of cancers in their population. Sufficient resources should be spent on screening. Centralization of care should be considered when appropriate. Approval of new drugs, innovative surgical and radiation technologies should be done in the context of their overall impact on the whole cancer patient population and should be guided by definite medical evidence. Community outreach and education are essential to involve patients in their own care and may help decrease the burden of the disease through prevention, early detection and treatment.

Globalization has made the world smaller. Today, disease determinants and risks are easier spread than ever in the past. Knowledge, experience and empathy can also be readily shared to better the health of our human race.

Addressing barriers to optimal cancer care among underserved Arab Americans

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Background

Arab American cancer patients are faced with numerous barriers to optimal cancer care, including language barriers and cultural factors. This unique pilot project is a comprehensive intervention to address socioeconomic barriers to optimal cancer care. The Integrated Cancer Awareness Access Network is the first program of its kind to use a bi-lingual multi-disciplinary team to systematically target socioeconomic barriers to cancer care among underserved, Arab American cancer patients.

Objective

This study investigates the socioeconomic needs of underserved Arab American cancer patients participating in ICCAN in New York City. Results will be used to tailor cancer services delivery programs for this population.

Methods

Our needs assessment is guided by Glasgow's Logic Model of Role of Perceived Barriers and Related Constructs to Patient Self-Management/Adherence. Bilingual Arabic/English Access Facilitators approached patients in the clinic waiting rooms and administered an intake needs assessment survey in the patient's preferred language. Descriptive statistics, cross-tabulations, and tests of proportions were used to examine socio-demographic characteristics, comorbidities profile, and stated needs for assistance.

Results

Fifty nine patients (47 female, 12 male) were recruited at ten hospital-based cancer clinics in New York. Thirty five percent were 40 to 49 years of age. All but one were born outside of the U.S., with the majority of participants from Egypt (36%), Morocco (17%), and Syria (8%). Thirty-six percent had resided in the U.S. for fewer than 10 years. Fifty-seven percent preferred to speak Arabic in the health care setting. Thirty-one percent of the patients were uninsured; twenty-one percent were on Emergency Medicaid, which covers the treatment costs of medical emergencies for undocumented immigrants, who are otherwise ineligible for health insurance.

The most common cancer site was breast (58%), followed by lung (7%). Of the 33 patients with comorbidities data, 18% reported at least one psychological disorder and 46% at least one physical disorder. Half did not have a Primary Care Physician prior to their cancer diagnosis. The following areas of need were identified: financial support (86%), transportation assistance (74%), food support (70%), medical interpretation (63%), supportive services (57%) and help with health insurance issues (38%).

Conclusions

In this pilot study of largely immigrant Arab cancer patients, we found that comorbidities are common. We also determined that a large proportion of patients need economic and logistical support. Without such support, Arab cancer patients are at risk for poor outcomes. Future research should further explore the impact of multi-disciplinary interventions addressing social and economic barriers to healthcare, particularly cancer care, for this vulnerable population.

Family Communication and Cancer Literacy Among Arab Women in Dearborn, Michigan, USA

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Background and objective

Health literacy and the family can be used to promote health care decision-making to improving cancer screening rates. The objectives were to investigate the associations of socio-demographic factors, family communication, and breast and cervical cancer literacy in an Arab population in the city with the largest proportion of Arab Americans in the United States.

Methods

Data were obtained from the ongoing Kin Keeper^{SM} Cancer Prevention Intervention randomized controlled trial. The study population includes 233 Arab women who are ongoing participants in the trial. Inclusion criteria were: aged 21-70 from public health programs that used community health workers from the Arab Community Center for Economic and Social Services (ACCESS) in Dearborn, Michigan. ACCESS serves the largest Arab population in the United States. Baseline data from the Kin Keeper^{SM} Cancer key variables were based on the Family Adaptability and Cohesion Scale (FACES) IV, the Breast and Cervical Cancer Literacy Assessment Tools, and an extensive recruitment questionnaire including socio-demographic characteristics, health behaviors, and other factors.

Results

Over 62% of the Arab women showed high levels of family communication as evidenced by FACES IV scores. Approximately 48% of the Arab women demonstrated functional breast cancer literacy, and 36% had functional cervical cancer literacy. Bivariate analyses indicated that being single or never married was associated with lower odds of a high family communication score, and being employed showed a trend toward reducing the odds of a high family communication score. Arab women who were separated or divorced had increased odds of a high family communication score compared to married or widowed women. Cancer literacy was associated with higher educational level, employment, and family self-rated health status (SRHS). In addition, women in families with large age differences among family members had increased cancer literacy

Conclusion

Family-centered networks may be a viable resource for the inter-generational transmission of health cancer literacy information, inform health care decision-making, and potential contribute to decreasing breast and cervical cancer mortality.

Key Words

Family communication, breast and cervical cancer screening, health literacy, Kin KeeperSM, Women's health, Medically Underserved

An Analysis of the Arab Community for Economic and Social Services' Breast Cancer Outreach Program

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Purpose

The ACCESS Breast Cancer Outreach Program (BCOP) aims to increase the utilization of cancer education, prevention, and screening services for roughly 2000 patients annually. The specific services of this program include home visits with Arab American women at risk of cancer, dissemination of information about mammograms, pap smears, and other health screenings, facilitating necessary health referrals, and providing cultural assistance with services for the prevention and treatment of breast and cervical cancer. Our aim is to conduct an analysis of patient demographics, healthcare information and utilization, breast cancer family history, and attitudes towards breast cancer prevention and treatment and propose intervention strategies that will improve the effectiveness of ACCESS BCOP services.

Methods

During home visits patients fill out confidential client intake data with questions and answers on various topics. A minority of patients sought services at the ACCESS Community Health and Resource Center and completed their intake data there. Intake data was collected and summarized into annual aggregate reports for the years 2004-2011 for roughly 1499 to 2100 patients each year. An objective analysis of all patient responses with a statistical report of the observed trends generated.

Results

The majority of patients in the ACCESS BCOP listed their primary language as Arabic, were not born in the US, and mark their race as "other" as opposed to "white." Outreach workers and "word of mouth" are important sources of program dissemination as opposed to clinic/healthcare provider dissemination. The reported incidence of patients with breast cancer peaked and has since plateaued. Patients also reported higher rates of family history of breast cancer when compared to the American population. A large majority of patients are waiting over two years for a mammogram (22.6%-42.6%), with over 90% of patients who have not yet had a mammogram citing cost and a lack of health insurance as a reason for this. Patients cite fear of the mammography machine and believing that there is nothing wrong with them as reasons for not obtaining screening mammograms.

Conclusions

Intervention strategies aimed at improving the ACCESS BCOP should include the following points. (1) Reutilize area clinics and healthcare providers in addition to outreach workers to disseminate program information (2) Clarify what is meant by "family history of breast cancer" to include specific reference to first-degree family members only. (3) Investigate why a large proportion of women eligible for screening mammography are waiting two years or longer without having one. (4) Investigate who is providing women with breast exams that they may deem as both adequate and occurring outside of a clinical encounter. (5) Provide education on breast self-exams and employ medical professionals to teach women how to perform such. (6) Educate the community about the ability of the BCOP to coordinate free breast and cervical diagnostic services. (7) Address specific fears/reservations about mammography.

Implementation of Lung Cancer Screening Guidelines in Arab Communities

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This presentation offered a brief overview of lung cancer risk at the population level with focus on populations with high smoking prevalence rates particularly the Arab communities in the US and abroad.

Evidence-based recommendation of the US Preventive Services Task Force in regard to use of annual screening using low-dose spiral computed axial tomography (CT scans) for people who meet eligibility criteria was summarized. Cost effectiveness of screening, its potential impact on reducing lung cancer mortality and status of insurance coverage for the test was also presented.

Lung cancer screening was discussed as part of a multidisciplinary care approach highlighting key components of a Lung cancer Screening Program which offers individuals: pre-screening counseling regarding the potential benefits and risks of screening, explanation of the sensitivity and specificity of the test including its high false-positive rate; post-screening interpretation of CT findings; full management of pertinent CT findings to capitalize on Benefit-Risk balance.

It is important to develop culturally-tailored and linguistically-sensitive programs to address the continuous spectrum of lung cancer control from primary prevention as part of the mortality reduction strategies, focusing on the avoidance of tobacco use in all of its forms, second-hand tobacco smoke, and environmental exposure to other known lung carcinogens, to smoking cessation; early detection; treatment and survivorship care management.

There is a persistent need for enrollment of Arab patients in clinical research studies that could advance knowledge on the benefits and risks of lung cancer screening.

The presentation lead into a short interactive discussion inviting session participants to share thoughts on: The role of the health care provider in implementing a comprehensive approach to lung cancer screening? The role of community-based organizations, employers, health plans and/or other entities?

Disparities and Inequalities in Cancer Care in Middle Eastern countries

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Introduction

As cancer incidence and mortality rates have begun to level and then decline in the western countries, the burden of cancer has shifted more and more to the developing world. In fact, in most developing countries, cancer incidence and mortality rates continue to rise, contributing significantly to the overall increase in new cancer cases and cancer deaths. This is unfortunately the case in the ME countries.

Objectives

Disparities in cancer in the ME countries are understudied, despite the increasing incidence of this disease in this area.

Results

Disparities in Cancer epidemiology and treatment are affected by:

- Diversity of the population who come from different ethnic and racial backgrounds, genders, social classes, and different geographical regions.
- An analysis focusing on the geographical disparities in cancer cases underline the huge differences from one country to another and from one region to another in the same country.
- Advanced age: is a principal risk factor for under treatment of cancer or treated less aggressively.

Recommendations

- Urgently develop and, where existing, improve national cancer plans,
- Firmly tackle the socio-economic and geographic divide, which leads to inequalities in cancer control.
- Vigorously promote cancer awareness in the general public through the existing codes against cancer (European, American, or Canadian..)
- Invest in cancer prevention through implementing the international recommendations on Cancer Screening
- Oppose discrimination because of age, race, gender and domicile in respect of the latest cancer treatments
- To support efficiently the fight against cancer, cancer patient's organizations must adopt a large variety of activities at different levels

Conclusions

In 2015, people with cancer in the ME countries still faced vast global discrepancies in the quality of their care. If every cancer patient was treated and cared for in accordance with the best standards, much suffering and dying would be prevented

Breast and endometrial cancer: an emerging public health crisis associated with obesity

Michele Cote

Wayne State University

Breast cancer (BC) is the most commonly diagnosed cancer among women in the United States (U.S.). Incidence rates rose until the early 2000's, then decreased by about 7% in a 2-3 year period, and have stabilized since that time. BC is the most commonly diagnosed cancer among women in most of the Arab world, and it is estimated that rates will continue to increase as the disease burden continues to shift towards chronic diseases. Some evidence suggests that age of onset is earlier than what is seen in other regions of the world.

Endometrial cancer (EC) is the most common gynecologic cancer in the U.S. and is expected to become increasingly important in other countries as incidence of cervical cancers decline. Over the last decade, incidence rates have been increasing, with larger increases among Asians, African Americans and Hispanics in the U.S. The number of EC cases diagnosed annually is expected to increase dramatically in the next two decades in the U.S. Rahib et al. estimated that the approximately 50,000 cases seen in 2010 will increase to 82,000 cases annually in 2020, and more than double by 2030, with 122,000 cases expected to occur. Mortality is also expected to rise, with a 43% increase in the number of deaths due to endometrial cancer from 2010 to 2030. Estimates were not presented by race/ethnicity, and do not account for histologic subtype, which suggests that the mortality rates presented may underestimate the actual increase for certain race and ethnic groups. The burden of endometrial cancer is not well-defined in the Arab world.

A potentially modifiable risk factor, obesity is linked with a number of cancers, but the strongest association is with EC. The rising incidence of EC has been attributed to various factors, including the obesity epidemic, although it has been suggested that obesity alone is unlikely to explain the increase seen over the past decade. Limited evidence suggests other factors may play a role, including the widespread decrease in the use of menopausal hormone therapy including progestins, changes in reproductive behaviors, and the increasing prevalence of diabetes. There is a well-described interaction between obesity and age associated with BC, with normal weight women having greater risk of premenopausal BC, but reduced risk of postmenopausal BC. Risk of recurrence appears to be increased for overweight and obese women compared to those of normal weight. Risk associated with obesity may be modified by tumor subtype.

The Arab world is undergoing a major epidemiological transition, with the disease burden from non-communicable causes increasing significantly over the last 20 years, as it shifts away from infectious disease. In addition to obesity, we will discuss how as the populations in these countries age, changes in diet and fertility patterns may converge into higher incidence of breast and endometrial cancers.

Assessing Socioeconomic determinants of breast cancer diagnosis and treatment completion

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Background

Breast cancer is the most commonly occurring cancer among Egyptian women. Egyptian patients appear to have a younger age distribution, with the majority of cases occurring at 30–60 years of age, and the median age at diagnosis being 49 years. Low socioeconomic status and low educational attainment are associated with poor health outcomes among breast cancer patients. This pilot study examines potential socioeconomic barriers to optimal cancer care. The Integrative Cancer Awareness Access Network (ICCAN) is the first program of its kind to systematically target socioeconomic barriers to cancer care among underserved cancer patients in New York City. ICCAN was culturally and linguistically adapted for use with breast cancer patients in Egypt.

Objective

This study investigates the socioeconomic determinants of breast cancer treatment completion, and quality of life of Egyptian breast cancer patients. Results will be used to tailor cancer services delivery for this population.

Methods

A cross-sectional study is being conducted in Ain Shams University (ASU) Hospitals. This study is a collaborative effort with investigators at the Immigrant Health and Cancer Disparities Service at Memorial Sloan-Kettering Cancer Center. Our intervention is guided by Glasgow's Logic Model of Role of Perceived Barriers and Related Constructs to Patient Self Management/Adherence. Researchers approached patients in the clinic waiting rooms and administered an intake needs assessment survey in Arabic. Descriptive statistics, cross-tabulations, and tests of proportions were used to examine sociodemographic characteristics and stated needs for assistance.

Results

Forty Five patients have been recruited to date at ASU clinics in Cairo where the results of nineteen of them have been analyzed. The following areas of need were identified: financial support (76.5%), information about breast cancer diagnosis and treatment (53%), transportation assistance (41%), and supportive services (35%). The median time from experiencing a symptom to breast cancer diagnosis was 28.5 days (min: 1 day, max: 3.5 years). 47% of patients faced obstacles in completing investigative tests (i.e. sonogram and biopsy), which included cost of tests; distance; and long wait to schedule the appointments. Of note, 23.5% of the participants reported having a family history of cancer: breast (50%), ovarian (25%) and colorectal (25%).

Conclusions

In this pilot study of Egyptian breast cancer patients, we found that a large proportion of patients needed economic and logistical support. We also identified health awareness gaps and structural barriers to accessing cancer care. Future research should explore the impact of multi-disciplinary interventions addressing social and economic barriers to cancer care for this vulnerable population to serve as a basis for policy making.

Breast Cancer among Young Omani Woman

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Introduction

Female breast cancer (BC) is the most frequently diagnosed malignancy, constituting about 23% of the globally diagnosed cancers.

Demographics

BC incidence varies geographically, being highest in Western Europe and lowest in Africa. BC in females is strongly correlated with age. The highest incidence rate is recorded among older women reinforcing the importance of hormonal status. BC in young females has an aggressive phenotype.

Observation

There is a shared observation amongst practicing oncologists that BC in Middle East and the developing world presents at an earlier age.

Methods

BC cases registered from 1996-2010 all over the Oman, were retrieved from the National Cancer Registry, Ministry of Health. BC cases were analyzed with respect to age at presentation. The data were compared with regional and international data.

Conclusion

BC is reported at a younger age from developing and Arab World, which needs to be further studied and validated. This phenomenon of BC in younger age may have significant implications and effects ranging from screening, diagnosis, management, prognosis, and cost of treatment

Challenges of breast cancer screening in the MENA region: which model do we adopt

Zahid Al-Mandhari

Oman Cancer Center

Selecting the best screening modality for breast cancer in the MENA region is challenging for many reasons. Although breast cancer is the most common cancer in these countries, the majority of cases present in advanced stages compared to the developed countries. This makes screening a necessity if we are to achieve better outcomes. In this presentation we examined challenges and discussed the pros and cons of several screening strategies. We discussed several regional examples outlining successes and failures with the hope of learning from them. Finally we looked at a feasible breast cancer screening model for Oman and the region.

Implementing an Obesity Reduction Program among Palestinian Refugees with Diabetes

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Nada Abu Kishk, Abbas Alawieh
United Nations Relief and Work Agency (UNRWA)

Background

The United Nations Relief and Work Agency (UNRWA) is responsible for the delivery of care for Palestinian Refugees in the Middle East and North Africa region. Given limited resources, UNRWA provides primary health care services and specialized treatment for two select chronic conditions; diabetes and hypertension. In 2013, UNRWA implemented a voluntary obesity reduction program for Palestinian refugees with diabetes.

Methods

A total of 799 Palestinian refugees voluntarily enrolled into the six-month obesity reduction program. Health assessments were conducted by nurses and physicians on day one, day 90 and day 180. Nurses and doctors at each health center collected information pertaining to body mass index, blood pressure, cholesterol and postprandial blood glucose (PPGT).

Results

There was a significant increase in the number of individuals with normal PPGT from month one to month three (p-value <0.0001), 210 and 383, respectively. Additionally, there was a significant increase in the number of individuals with normal blood pressure from month one to month three (p-value <0.0001), 399 to 441, respectively. By month six, there were significant increases in the number of individuals with normal PPGT (p-value <0.0001), normal blood pressure (p-value <0.0001), and normal cholesterol (p-values <0.0001).

Discussion

The obesity reduction program resulted in significant positive health vital change for Palestinian refugees. Although there was no significant differences in the number of individuals who were obese from beginning to end, the program educated refugees on the importance of self-management for their diabetes. UNRWA will continue to implement this program moving forward with the hopes of increasing the number of individuals that participate.

Metabolic Syndrome Complex in Arabs: Diabetes, Obesity, Dyslipidemia and Cardiovascular Complications

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Hamad Medical Center, Doha, Qatar

Metabolic Syndrome is a group of metabolic disorders or risk factors that predispose to cardiovascular diseases (Adult Treatment Panel – ATP III) and type 2 diabetes. This syndrome is likely result from the interaction of genetic susceptibility, environmental factor and lifestyle choices; and is affected by age, gender and ethnicity. Abdominal obesity and insulin resistance are two main characteristics of this syndrome. Other components of the metabolic syndrome include dyslipidemia (high triglycerides and low HDL), hypertension and systemic inflammation. Metabolic syndrome is highly prevalent among Arab individuals.

The overweight and anemia double burden of malnutrition fuels gender health inequalities in an urban North-African nutrition transition context

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Introduction

Gender has long been a major social determinant of health inequalities worldwide, (including in the Middle East and North Africa (MENA) region), as a result of a combination of both sex-linked biology and gender relations influences on health outcomes [1]. Moreover, the rise in overweight and obesity that this region has recently experienced has only worsened that gender health gap, as the increase has been especially drastic among women [2,3]. Nevertheless, this increase in corpulence is not exclusive of the persistence of undernutrition phenomenons such as anemia, to which women are especially prone [4] . Indeed it has been shown in some contexts subjects featuring a double-burden of excess body weight and anemia, with e.g. a noticeable prevalence in urban areas in Tunisia and Morocco [5].

Objective

The objective was, in a typical MENA nutrition transition setting, based on large scale epidemiological data: - to quantify the magnitude of gender inequalities vis-à-vis the double burden of overweight/anemia or obesity/anemia, - to analyze the variation of these inequalities with socio-economic co-factors, - to discuss them in a sex-linked biology vs. gender relations framework with a public health perspective.

Methods

A cross-sectional study, carried out in 2009-10, used a stratified 2 stage cluster sample to survey 20-49 years adults (women n=1689, men n=930) of the urban and peri-urban Greater Tunis area. BMI = weight(kg)/height(m)2 ≥ 25 kg/m2 defined overweight and BMI ≥ 30 kg/m2 obesity. Hb (hemoglobin) concentrations were determined in whole blood and anemia defined as hb < 120 g/L for women and 130 g/L for men. We studied the coexistence at subject-level of overweight and anemia, and obesity and anemia. Our measure of gender inequality was the women vs. men prevalence Odds-ratio (OR) [3]. Variation of gender inequalities by area and socio-demographic characteristics (also known as intersectional analysis in the social science field [6]) was studied by multivariate logistic models with gender x covariate interactions and computing adjusted gender ORs within each category of the covariates (urban vs. peri-urban area, the 4 governorates of the Tunis area, age, marital status, education, profession, household welfare). Type one error risk was set at 0.05 (0.20 for interactions).

Results

Gender inequalities regarding overweight (Women: 69.5% vs. Men :51.7%, OR = 2.1[1.7-2.6]) or obesity (Women: 36.9% vs. Men: 17.3%, OR = 2.8[2.2-3.6]) were high, and even higher for anemia (Women: 38.1% vs. Men: 8.0%, OR = 7.1[5.3-9.4]).

They were staggering for the double-burdens of overweight and anemia (Women: 25.7% vs. Men:3.7%, OR = 9.0[5.8-14.1]) or obesity and anemia (Women: 12.8% vs. Men:1.2%, OR = 12.0[6.2-23.3]) though the overall prevalence of the latter was smaller. There was a marked variation of the corpulence gender inequalities measures as e.g. for overweight the women vs. men adjusted OR increased with age (from OR = 1.4[0.7-2.1] for 20-29 years to OR = 4.5[2.7-6.2] for 40-49 years, P = 0.021), but decreased with level of professional activity (e.g. 3.5[1.4-5.6] for not working subjects, 2.8[1.8-3.8] for employees/workers, and 1.2[0.7-1.8] for upper/intermediate professions, P = 0.0066) and household welfare (from OR = 3.7[2.1-5.4] in the lower tercile of the welfare proxy to OR = 2.0[1.1-2.8] in the higher tercile, P = 0.094). On the contrary, although the overall very marked gender anemia inequality decreased with age (from OR = 20.7[0.0-40.3] for 20-29 years to OR = 4.0[2.1-5.9] for 40-49 years, P = 0.048) and was higher among married subjects (OR = 9.5[4.3-14.6]) vs. not (OR = 3.0[1.0-5.0]), (P = 0.012) it was otherwise rather similar across all places of residence or socio-economic categories. Thus, gender inequality regarding the overweight and anemia double burden varied little either with place of residence (urban vs. rural P = 0.59, governorates P=0.60) age (P = 0.42) or socio-economic characteristics (education P = 0.68, profession P = 0.80, household welfare = 0.58). This double burden gender contrast was much higher among married subjects than those not (OR = 16.5[0.5-32.6] vs. 2.4[0.5-4.3], P = 0.0076), but supplementary analyses showed this association was mostly confounded by parity (detailed data not shown). Analogous results were observed for obesity.

Discussion

In a typical nutrition transition setting of the MENA region, with high prevalences of overweight or obesity, we observed a sizeable gender corpulence inequality detrimental to women. As observed in the same and/or other MENA settings the intersectional analysis underlined a marked social gradient of these corpulence inequalities, with links to socio-cultural issues related to women's social role [3,7,8]. With anemia still very prevalent among women but not among men, the gender inequalities were even greater regarding that condition. As already observed in the same context for the prevalence of anemia among women [9], the distribution of gender anemia inequality was much more uniform across place of residence or socio-economic categories; this in agreement with data showing that a number of major etiological factors of anemia among women e.g. linked to reproductive life and/or inadequate iron intake, are quite uniformly distributed over socio-economic categories in our population (this especially applies iron deficiency anemia which represent a sizeable proportion of our anemia cases – detailed data not shown) [9]. The combination of these overweight and anemia gender inequalities resulted in a huge multiplicative double burden of malnutrition gender gap which fuels gender inequities in health in this context.

Conclusion

Our results are an example of how multivariate health indicators can give a different perspective on social health inequalities issues in the context of the nutrition and epidemiological transition, with an application here to gender health inequalities which are a specific issue in the MENA context. From a public health perspective, this underlines the need for a voluntary commitment to gender related concerns to tackle both the sex-linked biological determinants (as has been successfully done in the same context for other health issues [10]), and the socio-cultural issues which underlie these staggering gender double burden inequalities.

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Demonstrating the clinical efficacy of multi-modality (system approach) of modified collagen, amorphous hydrogel, hydrophilic polymer and an absorbent dressing in managing diabetic wounds, venous stasis and arterial insufficiency wounds

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Abstract

Managing wounds of various etiologies has become a significant clinical challenge. This challenge is more evident due to the fact that the underlying etiology is rarely managed successfully or cured. Patients with chronic disease (vascular and metabolic) frequently present themselves in the clinical setting with chronic, recalcitrant wounds that have festered for months to years. The ability to approach these types of wounds with a "system approach" to wound management is novel.

Introduction

There are many intrinsic factors that prevent wounds from healing regardless of the etiology. Some of them include poor circulation in the wound area, infected wounds and wounds with uncontrolled exudation. This case study will demonstrate the utilization of modified collagen, amorphous hydrogel and hydrophilic dressings in managing diabetic and venous wounds as a result of chronic disease. Modified collagen is an effective form of bovine collagen polymer. Fibroblasts utilize the molecule effectively and immediately when it enters the body. Thereby cleaving the collagen polymer chain and initiating a variety of cellular reactions such as migration and proliferation, angiogenesis, cytokine production and extra-cellular matrix formation, among others. This amorphous hydrogel contains modified collagen with the addition of glycerin. Glycerin is a known bacteriostatic agent (1). The combination of modified collagen and glycerin as a hydrogel has synergistic effect for wound healing. A highly absorbent hydrophilic polymer dressing plays a significant role in managing heavily exudative wounds as the polymer absorbs a significant amount of exudate. A heavily exudative wound interferes with the wound healing process. The absorbent dressing maintains a proper wound environment and simultaneously contributes to the wound healing process through its bacteriostatic properties.

Objectives

1) Understand the role of modified collagen in wound healing and its influences on cytokines. 2) Understand the role of amorphous hydrogel and hydrophilic polymers is addressing specific wound conditions. 3) Understanding the role and significance of early intervention with modified collagen, amorphous hydrogel and a hydrophilic polymer in patients with recalcitrant wounds secondary to underlying chronic disease which is often the result of excessive bio- burden.

Methodology

Patients were randomly selected from a diverse socio-economic background. Exclusion criteria included patients with osteomyelitis, patients who were deceased prior to wound closure and patient non-compliance with treatment. Wounds were managed with products representing the "system approach" which was available to the clinician. The average dressing change frequency was daily. Photo-documentation was taken pre-treatment, mid-treatment and post-treatment.

Results

The results demonstrated a marked improvement in wound healing with the wound etiologies treated in this study. The main benefits realized with utilizing all products within the multi-modality approach are as follows: a) an increase in the development of granulation tissue, b) a reduction in wound pain, c) minimize the potential of scarring, d) manage effectively any co- infection in the wound and, e) effectively managing highly exudative wounds.

Conclusion

The utilization of the multi-modality approach with these products to address wound etiologies meets the challenges of treating wounds. Specifically, the overall clinical impression of modified collagen is essential to achieving wound healing. The amorphous hydrogel possesses modified collagen which is synergistic and also has effective bacteriostatic effects. The hydrophilic polymer acts as an effective wound debrider and also effectively manages highly exudative wounds. Finally, the absorbent dressing is an excellent clinical compliment to the other products in the multi-modality approach.

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The role of Surgery in turning the tide of Non communicable disease in Oman: Obesity, Diabetes and Gastric cancer as Challenges at stake - The view from the Royal Hospital in Muscat

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Introduction

In recent decades, the scourge of non communicable diseases has been the thorn in the side of health evolution and health providers globally. With the rapid transitions in aspects of epidemiology, socioeconomics and technological advances, there has been a gradual mixing of planes on this globally shrinking ground blurring the borders among diseases. The paradox of seeing non-infectious diseases crossing fences is what raises the irony of calling them non-communicable when in fact they have conveniently chosen the best communication advances to spread the roots of their pathologies all around.

Oman is no exception. Obesity (which is now a disease by WHO standards), stands among the top ten global diseases in a planet reeling from an epidemic of more than 2 billion. Diabetes (Type II) affects around 15% of the world population, putting it on that list of top ten worldwide. Gastric cancer on the other hand is rated among the highest in the Middle East and is the number one killer in male cancers in the Oman.

The view from this angle, in relation to the above, is that all these can be managed surgically.

Bariatric surgery is now proven by evidence to be the single most functional and lasting vehicle for sustained weight loss and hence the most useful gateway to allay the damage caused by metabolic disease secondary to the above. In the same context, type II diabetes, following more understanding of its pathophysiology, is now targeted to effective resolution and maybe cured by timely and selected surgical procedures that are referred to in International (Medical) Diabetic forums. Gastric cancer, however, remains a nemesis due to late presentation. Nevertheless surgery has a definitive role, being the only chance for cure at all stages of the disease.

Oman's health sector evolution has been hailed internationally and is a continuum that saw the recent five year strategies' focus especially placed on non-communicable diseases. At the Royal Hospital in Muscat, which is the biggest referral centre in the country, the above named challenges were taken in full stride subsequent to setting the platform for advanced laparoscopy in 2009. The paper aims to shed a light on our journey thus far, including crossing the first centenary in Bariatric procedures, achieving more than 80% in DM resolution and offering Laparoscopic gastrectomy as the standard of care in gastric cancer with the highest series in the region.

Conclusion

At no time in the past has the management of disease seen more entwined and coordinated pathways among different disciplines of the Medical sciences as is the case today. The role of Surgery as a major player in these paths has stood its test and should be endorsed to ensure the best of care is always near.

Diabetes mellitus and cardiovascular risk scores among King Saud University employees and their families

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Background

Over last few decades the prevalence of diabetes has risen dramatically worldwide. Eastern Mediterranean Region (EMR) is counted amongst the highest rates of diabetes globally. All Gulf council Cooperation (GCC) countries are among the top ten countries with high prevalence of diabetes in EMR. Saudi Arabia ranks the highest prevalence of diabetes globally and regionally. The aim of the presentation was to assess the prevalence of diabetes mellitus (DM) as part of a larger cardiovascular risk (CVR) screening in King Saud University 's employees and their families.

Method

A cross sectional study design, WHO STEPS instrument was used to collect data from 4500 university employees and their families over 18 years of age, between July 2013 and April 2014. Framingham coronary heart risk score (FCRS) was utilized to calculate the cardiovascular risk (CVR) scores, and to identify: Low risk (<10%), intermediate risk (>10 %< 20%) and high risk (>20%).

Results

Of 4500 participants, 68% (n=3063) of them were Saudis, of which, 18% (n=548) had DM and in spite of going through treatment, DM in 52% of them was not controlled (HBA1C ≥ 7.5). Additionally, 25% (n=758) of Saudis were pre-diabetic. The prevalence of DM in Arab-non Saudi (ANS) and Asian was 16% and 24% respectively. In diabetic Saudis the prevalence of DM was significantly higher in females (64%) than males (36%, P <0.001) and particularly amongst 40-49 years and between 50-59 years age groups (71% and 66% vs. 29% and 34% P<0.001 respectively). Body mass index (MBI) ≥ 25 was significantly higher in diabetics than non-diabetics (90% vs. 68%, P<0.001).

Based on FCRS scoring; 74% of the diabetics had a high risk of developing cardiovascular events in the next 10 years compared to 26% of non-diabetics. The rate of CVR score was linked with age, 57% intermediate risk in 50-59 years and 66% high risk in patients aged ≥ 60 years (P < 0.001). Compared to Saudi men (63%), both ANS and Asian diabetic men had the highest rate of high risk (86%), while Saudi females had the highest rate of high risk (38%) than both ANS and Asian females (14%).

Discussion

Having diabetes increased the CVR especially high risk score by 3 fold in our study population. Risk of developing diabetes increases with age and body weight, currently the employees of university are young (37.06± 12.7) and Saudis are even younger (34.43± 12.7), the risk of developing DM therefore will increase as they get older. Additionally, one third of the study population had pre-diabetic, which over time convert to diabetes.

Conclusion and Recommendation

A secondary prevention programme to control and reduce diabetes complications is needed. In addition, an urgent implementation of primary prevention programme offering lifestyle modifications in diet and physical activity approaches are required to combat this public issue. Further research is required to investigate the reason for high prevalent diabetes in women 40-49 years old, and consider any early episodes of gestational diabetes as a possible reason behind this rate.

Palliative Care in Arab Countries: Challenges and Achievements

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Palliative care is a new concept in the Arab countries health care sector and it is mainly linked with cancer disease. Cancer is an increasing problem in the Arab countries. It is the fourth leading cause of death in this region. The curability of cancer is directly related to its stage at the time of diagnosis, and in the majority of countries of this region, cancer is generally diagnosed when it is at a relatively advanced stage. Given the impact of the late presentation problem, palliative care is of paramount importance.

From the situation analysis of palliative care in the Arab countries, suggesting that pain relief is insufficient, improvements in palliative care delivery are a high priority. In reality, the Arab countries suffer from the same barriers to palliative care as other developing regions of the world, which include:

1. Restrictive policies from health care providers towards access to opioids; these are due in great part to an over-concern about drug abuse.
2. Insufficient development of palliative care: too few palliative care programmes and of insufficient quality.
3. Lack of awareness of the “human right to pain relief and a peaceful death”.

Based on these available data, three priorities for action emerged:

1. Ensure full access to affordable inexpensive opioids for all patients in need; this is an internationally recognized principle.
2. Develop human resources for palliative care. Studies performed in various ME countries have shown that the most important barriers to efficient palliative care are the lack of knowledge in correct usage, or concern that patients may become addicted to opioids.
3. Develop home care programmes: Most patients requiring end-of-life care prefer to receive such care at home.

We can say that Palliative care in Arab countries has made some important strides in the last decade but it is still in its infancy, and urgent attention needs to be given to the implementation of the recommendations listed above. However, despite all efforts the subject of palliative care in Arab countries is still not approached scientifically. Research is lacking at all levels, and palliative care is delivered by non specialized physicians and registered nurses.

Making real improvements in pain management will require the proactive efforts of many organizations, and we believe that education as well as discipline should be the cornerstone of efforts to improve pain management.

Until we can reliably and easily cure cancer, it is imperative that the principles of palliative care be incorporated into comprehensive cancer programs. While much progress has been made, there remains a great deal of suffering in the lives of the patients cared for in the Arab countries.

At the end of this review, two main conclusions can be cited:

- Provision of PC provides better outcomes than usual care and is cheaper on the health care system in the long run.
- Continuing education programs in PC are needed in Arab countries.

Pain Relief Is a Human Right

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For centuries, medical and surgical treatment has emphasized saving the life of the patient rather than ameliorating the patient's pain, particularly when there were few options for the latter.

Today at the dawn of the 21st century, the best available evidence indicates a major gap between an increasingly understanding of the pathophysiology of pain and widespread inadequacy of its treatment.

Epidemiologic evidence has proven that chronic pain is a widespread public health issue. Studies of cancer patients' pain control consistently reveal that up to half of patients receive inadequate analgesia and 30% do not receive appropriate drugs for their pain. Equally, for patients suffering HIV/AIDS, 60%-100% will experience pain at some stage in their illness.

In the developed world, this gap has prompted a series of declarations and actions by national and international bodies advocating better pain control. One response to the worldwide under treatment of pain has been to promote the concept that pain relief is a public health issue of such critical importance as to constitute an international imperative and fundamental human right.

The importance of pain relief as the core of the medical ethic is clear. Pain clinicians promote the status of pain management beyond that of appropriate clinical practice or even an ethic of good medicine. They advocate a paradigm shift in the medical professions' perspective on pain management, from simply good practice to an imperative founded on patient rights.

There is a need to promote policies which create conditions where human beings can bear even incurable illnesses and death in a dignified manner. This must help health professionals or lay groups to initiate a powerful agenda to reform local statutes. The essential components of such legislation are:

1. Reasonable pain management is a right.
2. Doctors have a duty to listen to and reasonably respond to a patient's report of pain.
3. Provision of necessary pain relief is immune from potential legal liability.
4. Doctors who are notable or willing to ensure adequate analgesia must refer to a colleague who has this expertise.
5. Pain management must be a compulsory component of continuing medical education.

For too long, pain and its management have been prisoners of myth, irrationality, ignorance, and cultural bias. We are confident that the National Committee for Palliative Care under the auspices of the Ministry of Public Health is the main promoter of Palliative Care in Lebanon whose main goal is to relieve suffering and improve quality of life of the cancer patients, and advocate pain relief as a human right.

Interleukine-17A positively regulates human Mycobacterium granuloma formation andmaintenance

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***Keywords:** Tuberculosis, granuloma, multinucleated giant cells,IL-17A*

Introduction

Tuberculosis (TB), caused by Mycobacterium tuberculosis infection, is a deadly disease which mainly affects lungs. The histological hallmark of TB is the formation of small nodules called granulomas in affected tissues. These structures, crucial to restrict mycobacterial growth, are formed by a myeloid cell core, containing multinucleated giant cells (MGCs) and surrounded by T lymphocytes. In humans, the mechanisms of granuloma formation and maintenance are largely unknown. However, in mice, it was recently shown that the pro-inflammatory Interleukin-17A (IL-17A) cytokine plays a critical role in Mycobacterium granuloma maturation and maintenance [1, 2]. Importantly, IL-17A also induces human myeloid dendritic cell (DC) fusion leading to MGC formation, in vitro[3].

Hypothesis

As IL-17A (i) regulates TB granuloma formation and maintenance in mice, and (ii) promotes *in vitro* formation of human myeloid MGCs; we hypothesize that IL-17A may also regulate *in vivo* TB granuloma formation and maintenance in humans. We suggested that myeloid cells of human TB granuloma may be recruited, fused and maintained through IL-17A dependentmechanisms.

Materials and methods

We performed *in vitro* cell cultures to characterize the molecular mechanisms of the IL-17A-dependent fusion pathway of human DC. Transcriptomic analysis, qPCR, ELISA and antibody-mediated neutralization studies were used to decipher the key molecules that regulate this fusion pathway. To investigate if these key molecules are expressed in human TB granuloma, *in situ* immunohistofluorescent staining was performed on granulomas from ten TBpatients.

Results

We demonstrated that, *in vitro,* IL-17A stimulates DC survival by inducing the expression of the pro- survival Bcl-2 family member BFL1. IL-17A promotes also DC clustering and fusion in MGCs through the stimulation of CCL2 and CCL20 chemokine production. Using immunofluorescence, we found that IL-17A is expressed by human TB granuloma lymphocytes and demonstrated that BFL1, CCL2 and CCL20 are also expressed by the myeloid cells of thegranuloma.

Conclusions

We propose that IL-17A participates in human TB granuloma formation and maintenance by promoting survival, clustering and fusion of myeloid cells of the granuloma core. Overall, these findings will open novel strategies to control granuloma formation andmaintenance.

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Status of Infection Control in Healthcare Settings in the Arab World

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Emerging, reemerging and infectious diseases with pandemic potential pose a great threat to global health security. The problem is exaggerated in the Arab countries where the prevalence of infectious diseases still represents an increasingly major public health problem. In the majority of healthcare settings of the Arab countries, there is lack of sound infection prevention and control (IPC) programs that help reduce the spread of infectious diseases. The characteristics of healthcare settings and the status of IPC in the Arab countries vary according to the economic capacity of the country. The recent emergence of MERS-CoV in September 2012 in the Eastern Mediterranean region uncovered the limitation of the IPC programs even in countries with adequate resources. Effective surveillance programs for healthcare-associated infections are rarely implemented which delays adequate and timely response. The presentation described the different tiers of IPC programs in the Arab countries and the association with transmission of infectious diseases. Challenges and opportunities of instituting sound and effective IPC programs in the Arab World were also discussed.

__Disclaimer:__ This work has been submitted for publication. The title and the content of the abstract are not excatly the same as the submitted version.

Exploring the Potential Role of Killer Immunoglobulin Receptors (KIR) Genes in Susceptibility to Hepatitis B Virus (HBV) Infection Post Vaccination

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Abstract

This study aims at identifying the role of killer immunoglobulin receptors (KIR) in responsiveness or non-responsiveness to HBV vaccination as well as susceptibility to breakthrough HBV infection post-vaccination. Sera samples of 101 HBV vaccinated and non-vaccinated study participants were tested for the presence of anti-HBs antibodies as a measure of protection against hepatitis B, hepatitis B surface antigen (HBsAg) and hepatitis B core antibody (anti-HBc) as indicators of infection. We performed KIR genotyping on samples from all study participants (vaccinated and non-vaccinated). KIR genes frequencies were determined and linkage disequilibrium analysis between pairs of gene loci was performed. We did not find any significant association between the number of vaccine dosages and the titer of antibodies (< 10 mIU/ml, 10-100 mIU/ml, >100 mIU/ml) among our vaccinated participants. Our study shows the lack of association between the frequency of KIR gene expression and the levels of anti-HBs antibodies. 9% of the vaccinated participants had undetectable levels of protective antibodies. Importantly, anti-HBc was positive in 3% of our study participants presenting with anti-HBs levels ranging between 110-1000 mIU/ml indicative of breakthrough infection following vaccination or immunity as a result of natural infection. Importantly, we did not find any significant difference in the frequency of KIR gene expression between the hepatitis B vaccinated individuals with protected antibodies titers as compared to those who lost their protective levels. HLA-C1C2 expression was predominantly expressed among vaccinated participants with undetectable immunologic titer post vaccination as well as participants with positive anti-HBc sera. Moreover, KIR2DL1-HLA-C2 and KIR3DL1-HLABw4 were expressed by all vaccinated participants with undetectable immunologic titer post vaccination as well as those showing breakthrough infection, respectively. We suggest the possible involvement of KIR2DL1-C2 interaction in protection against HBV among HBV-vaccinated individuals.

***Keywords:** HBV, KIR, HLA, anti-HBsAg, vaccine*

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Saudi Family Physicians Perceived Patient Satisfaction and the Actual Patient Satisfaction – Is There a Gap?

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Introduction

Despite the significant development of family medicine in the last two decades in Saudi Arabia, majority of the population, and even some healthcare professionals, are not aware of the importance of this field of medicine. (1) Family medicine is a field that is aimed at providing the greatest patient satisfaction and thus, producing the best results in healthcare. (2) But in actuality, is that being achieved here, or is there a gap? From the literature, we see that patient doctor interaction has a significant impact on the patient's satisfaction, and thus, their compliance. This affects their health outcome. Thus, effective doctor-patient communication is the bedrock for better patient outcome. (3, 4, 9, 10, 12) But, it has been reported that most allegations of healthcare malpractice are a result of miscommunication. (7) This is supported by other studies' findings that state that in 50% of the cases, doctors and patients do not agree on the chief complaint. (5, 6) and the most common patient complaint is regarding troubles in communication, not the clinical skills of the doctor. (7) Studies have also reported that only 52% of patients are satisfied with their care right after their interaction with the doctor (11) and thus, up to 40-50% of the patients are likely to be noncompliant to the doctor's recommendations. (13) Furthermore, it has been reported that 7 -47% don't understand their diagnosis, 13- 53% don't understand the prognosis, and significant number of patients also don't understand the information about their treatment. (8, 13)

Objectives

Hence we were interested to find if there is any discordance between physicians' perception of how satisfied the sensed their patients are with them, and the reality of how satisfied their patients are. Our search of the current available literature did not result in any studies specifically aimed to explore this. Thus our study aims to look into these following objectives:

1. To evaluate family physicians self-perception of the quality of their patient care and assess the relationship between physicians' perceptions and patients satisfactions.
2. To measure satisfaction of patients managed by family physicians in Saudi Arabia.
3. To identify reasons behind possible "quality gap" between the services offered by family physicians and service received by patients.

Methods

Self-reflection has been used extensively to evaluate physicians' performance and in our study it was used as a tool for family physicians to self-evaluate whether they overestimate or underestimate the quality and level of care offered to their patients.

Hence, we designed a cross-sectional study, collecting data using a questionnaire. The questionnaire focuses on areas like communication skills, reaching common ground, trust, and ability of physicians to explore the patient's ideas and respond to their concerns. After a doctor-patient clinical interaction, an appointment, corresponding questionnaires were administered to both the doctor and the patient, to assess the patients' satisfaction and the doctor's perceived patient satisfaction for that interaction.

Results

Majority of our patients were females (73%), with 50% of them visiting the doctor for regular checkups of chronic disorders. Up to 77% of patients were satisfied with the care provided by their physicians, while 64% of physicians were satisfied with the care they were able to provide to their patients. Over half of the doctors strongly agreed that they show care to their patients' families

Conclusion

Although the specialty of Family Medicine is relatively new to the Saudi society, yet the family physicians are self-reporting the provision of high level of care to their patients which is well appreciated by their patients.

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Education and Health Workforce Development in Community Settings

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An overarching goal in the health community is to foster and develop social and physical environments that promote wellness and good health for all. One important consideration in working toward this goal is addressing the impact of social determinants, including economic stability, education, social and community context, health and health care, and the neighborhood and built environment. The focus of this presentation will be on the development and implementation of higher education health and wellness academic education and training programs, that include experiential, problem-based, and service-learning. Typically academic programs are designed as subject-specific and didactically focused, thus they do not address all of the known concomitant determinants and interactions of these subjects that together impact wellness and good health. This presentation provided the context for the interrelationships of these determinants, the need for innovative academic and workforce development programs, the benefits and challenges of these programmatic approaches, as well as anticipated near future careers and professions.

Barriers and facilitators to diabetes self-management in Arab Americans

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Introduction

Diabetes is a major health issue in the rapidly growing Arab American community. However, Arab Americans receive suboptimal care and are less likely to achieve glycemic control compared to the US national population. Diabetes self-management (DSM) is a crucial component of health maintenance and entails long-term change in lifestyle behaviors that are inherently shaped by a patient's culture. Culturally-specific barriers or facilitators to DSM in Arab Americans are unknown.

Objectives or Hypothesis

Our objective was to explore the barriers and facilitators to DSM from the perspective of Arab American patients.

Materials and Methods

Three focus groups were conducted with 23 adult Arab Americans with diabetes taking multiple medications in Dearborn, Michigan. Two mixed-gender (N=15) and 1 female-only session (N=8) were conducted based on our previous data revealing female silencing in mixed groups. A trained female Arabic-speaking, moderator used a standardized interview guide for each 90-minute session. Sessions were transcribed verbatim and translated. All transcripts underwent a second review by the moderator to ensure data quality. Transcripts were analyzed with standard content analysis by two independent coders who met to achieve code consensus.

Results

Primary themes include: the effect of Arabic culture on patient DSM (fatalism, traditional diet, Ramadan observance, and gender-segmented exercise), patient perspectives of the physician's role in DSM including issues of trust and cooperation, and personal, social, and environmental barriers and facilitators to DSM. Further data analysis is in progress.

Conclusions

Arab Americans experience unique barriers and facilitators to DSM and findings suggest a paucity of resources available to address these issues. DSM interventions and education should be tailored to Arab culture to promote healthy behavior adoption in Arab American patients.

Medical Research Performance and Challenges in the Arab Countries

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Introduction

Despite the differences in wealth and population size, Arab countries are frequently considered as one unit, mainly because of the common language, religion, culture and geography. Over the last five decades, living standards in most Arab countries have improved, especially oil producing countries. The number of medical schools and institutions has increased, and health services have improved. It appears that these advancements have not been matched by increases in quantity and quality of medical research which is essential for better health care in these countries.

Objectives

The aim of this presentation is to review published reports including scientific publications, international reports and ranking systems, on the performance and challenges of medical research in the Arab countries.

Methods and Findings

Review of available data revels that Arab countries contribution to scientific research including biomedical research is very limited. The total investment of the Arab world in research and development is less than 0.3% of its Gross Domestic Product (GDP) compared to 2.0 to 5% in developed countries. Studies assessing biomedical research output of Arab countries have been mainly quantitative with some international ranking indicators suggesting that medical research in the Arab world is of low quality and limited impact, and it lacks innovation. Arab countries contribute only between 0.01 and 0.3% to the global scientific publications and lag behind not only the developed countries but also non-Arab countries in the Middle East. The concept of advanced medical research appears to be lacking in the Arab world.

Discussion

Factors contributing to this very poor research performance include; lack of clear focus on research priorities, insufficient funding, low appreciation of the importance of high quality scientific research, poor networking opportunities, limited regional and international collaboration, and the brain-drain. In addition, scientific research in the Arab countries largely depends on government funding, unlike the developed countries where private sector plays a major role.

Conslusion

The emerging developments in medical research especially in the Gulf region with major investment in medical research infrastructure and funding are encouraging. However, the outcome of such initiatives remains to be determined.

Implementing the standard of care in the management of Surgical disease. The role of advanced laparoscopy: challenges and milestones in a major tertiary centre in Oman.

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Introduction

Over the past four decades major strides in the country's development took place in all fields including notably the Health sector. One major highlight was the establishment of the Omani Medical Specialty (Surgical) Board which initiated a new residency training program in 2007. Advances in surgery were to follow with emphasis on evidence based practice and standards of care. Advanced technology especially Laparoscopy was to be seen across the major hospitals of the country.

The Royal Hospital is the biggest tertiary referral center in Oman. The earliest steps in advanced laparoscopy started in 2008 and took a lift a year later with the launch of a Minimal Invasive Surgery unit in late 2009.There was a concomitant transition to sub-specialization in all surgical services in the Hospital. Over the subsequent four years laparoscopy went on to enter and evolve in all disciplines, albeit while overcoming many challenges.

Results

A preliminary analysis shows a paradigm shift to the use of Advanced Laparoscopy in both numbers and types of major (sub-specialized) abdominal procedures done for the first time. This was in Upper Gastrointestinal surgery (Gastrectomy for cancer, Reflux disease, Bariatrics and Metabolic surgery), Lower (Colorectal) surgery (colectomies) and Hepatobiliary (Liver cysts, pancreatectomy and Biliary explorations). In the same period, Laparoscopy became common practice in "routine" General surgical procedures like Hernia repairs, appendicectomy and more complex Cholecystectomy.

Other surgical disciplines (Pediatrics, Urology and Gynecology) similarly endorsed this path. Again, a similar but more gradual pace in other major centers in Muscat, the capital (University hospital , Army Hospital) and other major cities (Salalah, Sohar and Nizwa), was evolving with good outcomes.

Conclusion

The challenges to offering Laparoscopy as a tool to provide the standard of care (on the basis of best surgical practice) are well known in growing countries. These include establishing modern and encompassing infrastructure, providing facilities and equipments, ensuring adequate training of different staff members and maintaining long term outcomes through upgrading other post-hospital services. The evidence so far from our experience is that these hurdles are surmountable with perseverance and genuine commitment. The results and positive outcomes over the short period of its history mirror those seen in far longer established systems. The growing demands to change, however, ought to be balanced with realistic appreciation of available infrastructure and facilities. The path on this Highway, nevertheless, has been set by many a dedicated hand and it has so far proven that the way forward, is where it is heading.

The Palestinian Congenital Abnormalities Database: An Initial Report

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Background

Over the past ten years, our group has performed cleft surgeries in all of the major Government Hospitals in the Palestinian Territories. We have completed over 1,500 surgeries, without any deaths, and with minimal complications (limited to return to the operating room for bleeding, minor dehiscence), all of which were recognized and appropriately addressed.

Methods

Our initial volunteer surgical model involved taking full teams to Palestine, including surgeons, anesthesiologists, operative and post-operative nurses from outside the Palestinian Territories. As we have partnered increasingly with local professionals to work with affected patients, these surgeries (repair of cleft lip, cleft palate, bone graft, lip and nasal revision, and palate revision surgeries) have been performed with local Palestinian-only professionals, also with no mortalities, and few complications.

Results

This paper describes the process that we are interested in repeating in other Middle East locations. The shift from team members outside Palestine to team members from Palestine. Our teams will consist of Palestinian professionals who have completed training for the next effort in Gaza, and in Lebanon. Eventually, we would like to use this model as a training tool to raise the quality of cleft care throughout the Middle East.

Conclusions

Teaching of cleft care can be done safely and effectively with increasing reliance on local professionals (with decrease in the need for visiting professionals), and can be used as a model for establishing high class cleft surgeons throughout the Middle East.

Mental Health among Iraqi Refugees Displaced to the United States: Importance of Post-displacement Social Stressors and Institutional Resources

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Introduction

Refugees represent a vulnerable population with a dramatically increased risk for trauma-related mental health disorders with severe implication for long-term health, social and vocational integration, as well as healthcare costs. However, little is known about the role of post-displacement (migration) risk and resilience factors in determining the long-term mental health trajectory in the new host countries. Such knowledge would allow targeting limited resources to refugees at greatest risk.

Objectives

To determine social and institutional risk and resilience factors for post-displacement mental health disorders in newly arrived Iraqi refugees, as opposed to Middle Eastern immigrants, in the U.S.

Hypothesis

Post-displacement stressors and resilience factors are significant determinants of post-displacement behavioral health.

Materials and methods

Working in close collaboration with ACCESS and Lutheran Social Services of Michigan, we successfully recruited a random sample of 298 Iraqi refugees and 314 immigrants from other Middle Eastern countries not involved in conflicts at the time migration in 2011. Participants were interviewed at baseline, and after 1 and 2 years residence in the U.S. Over 90% (n = 286 and 283, respectively) of the original sample was retained. Participants responded to a structured survey covering sociodemographics, pre and post-displacement trauma and resilience factors, somatic and mental health. They took part in a structured diagnostic interview (SCID). The study was approved by the Wayne State University Institutional Review Board.

Results

Baseline revealed that self-reported and depression scores were higher for the immigrants (PTSD: *M* = 22.48, *SD* = 8.31; depression: *M* = 3.54, *SD* = 3.29) than for the Iraqi refugees (PTSD: *M* = 19.47, *SD* = 5.46; *p* < .001; depression: *M* = 1.89, *SD* = 3.50; *p* < .001). Baseline SCID confirmed these findings with immigrants more likely to receive a SCID depression diagnosis than refugees (12 vs. 2, respectively, *p* = .01). There was no significant difference in PTSD diagnosis between immigrants and refugees (1 vs. 6, respectively, *p* = .06). Iraqi refugees reported significantly more pre-displacement trauma (*M* = 12.54 events, *SD* = 3.51) compared to immigrants (*M* = 2.41 events; *SD* = 3.86; *p* < .001). Across both groups, high exposure to trauma was associated with worse mental health. Results indicated that pre-displacement trauma interacted with post-displacement trauma to prospectively predict unemployment two-years after arrival.

Conclusions

Iraqi refugees face numerous post-displacement stressors with adverse effect on their mental health trajectory. It is important to target supportive resources to those at greatest risk to develop post-displacement mental health, and subsequent disorders.

Acknowledgements

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Complementary and Alternative Medicine in Psychiatric Patients in the KSA

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Introduction

The interest in natural medicine continues to grow, with more patients presently using complementary and alternative medicine (CAM) therapies. Current medical literature highlighted the need for more understanding of the role of CAM therapies as an adjunct to standard psychotherapies. Previous studies have suggested that most clients who used complementary and alternative medicine do not inform their healthcare providers of their use.

Objective

To investigate the use of complementary and alternative therapies in psychiatry patients during treatment.

Material and Methods

We conducted a cross sectional study in adult psychiatric patients during treatment. A survey, “questionnaire”, developed by study PI and colleagues in previously published study in the United States was used. Demographics and baseline characteristics including age and gender were summarized using the descriptive statistics including mean ± SD, median and range, as appropriate. The study was approved by the Institutional Review Board.

Results

A total of 45 psychiatric patients from a major hospital in the city of Riyadh participated in this pilot study. 91% of the study participants were in an outpatient setting. The sample mean age was (35.4 ±11) ranged from 20-64. 62% of the participants were females, 51% were married, 33% singles, and 11% divorced. Major types of diagnoses were depression (48%), OCD (10%), anxiety (10%) and schizophrenia (10%). Most participants (82%) reported the use of CAM therapies within the past 12 months primarily for improving quality of life, symptom control and as supportive treatments. All CAM therapies users in the studied sample reported using spiritual therapies, mainly prayer, Quran recitation, and supplication; 86% reported using body therapies, mainly exercise, special diet, and topical herbs, and 78% reported using mind therapies, mainly relaxation and meditation. Most study participants (77%) were satisfied with the CAM therapy they used and 53% reported that they had discussed their use of CAM therapies with their psychiatrists.

Conclusions

In our sample, psychiatric outpatients most often used complementary and alternative therapies and were satisfied with the use of these therapies. Contrary to published data, more than half of the study participants reported they had discussed the use of CAM therapies with their treating psychiatrists. To our knowledge, this is the first study to report certain aspects of the use of CAM therapies among psychiatric patients in the KSA.

Primary Care and Mental Health Integration at ACCESS Community Health and Research Center

Mona Makki

ACCESS Community Health and Research Center, Dearborn Michigan

Integrated care is a systematic coordination of general and behavioral healthcare. Integrating mental health, substance abuse, and primary care services produces the best outcomes and proves the most effective approach to caring for people with multiple health needs. In well developed primary care-mental health integration programs, 70-80% of all mental illness is effectively managed in primary care. The goals of integrated care are to improve the patient experience of care, improve the health of populations, and to reduce per capita cost of health care. By following the integrated care model, it improves overall quality of life for persons with serious mental health illness through holistic, integrated and coordinated health care. Integrated Health Care is no longer a concept; it's a way of delivering care and doing business.

At ACCESS we follow the Four Quadrant Clinical Integration Model, in which we plan for and deliver services based on the needs of the individual, personal choice, and the specifics of the community and collaboration. By following the Four Quadrant Clinical Integration model, the expected outcomes are:

- Savings in total health care costs
    - Demonstrated in research (IMPACT, Pathways)
    - Demonstrated in real world evaluations (Kaiser Permanente, Intermountain)
- Improved patient and provider satisfaction
- Improved provider productivity
    - PCPs have shorter, more productive primary care visits = more visits
    - Mental health consultants in primary care have lower no-show rates
- Improved productivity
    - Reduced absenteeism
    - Higher incomes / net worth
- In safety net populations
    - Reduced homelessness and arrest rates

Cultural variations as pillar for culturally sensitive interventions for Arab refugees: Reflection from Oman

Nasser Al-Sibani
Ministry of Health, Muscat, Oman

Seismic events in the Middle East in the past decades have triggered displacement of a huge number of people. These uprooted individuals have been obliged to become “asylum seekers” in North America and Western Europe with all social, economic and health implications this may entail.

On one hand, studies conducted on Arab refugees have indicated that such population tends to exhibit various forms of mental health conditions. On the other hand, presenting symptoms of these refugees have been noted to be orthogonal to what is often observed in the Western-based psychiatric nomenclature. This renders providers of mental health services to be ill equipped to decipher and provide intervention for Arab refugees. The aim of this talk was to highlight how those societies hosting Arab refugees could learn from some preliminary mental health studies from Oman. The present discourse focus on how stress and distress is experienced in Oman. It is would be concluded that how stress and distress is experienced in Oman has potential to shed light on cultural variations as pillar for culturally sensitive interventions for Arab refugees in North American and Western Europe.

Acculturative stress, maternal exposure to trauma and mental health in children of Iraqi refugees resettled into the United States

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California State University, Fullerton California

Background

43.3 million Individuals worldwide have been forcibly displaced because of conflict and persecution (UNHCR, 2009). 15.2 million of these individuals are refugees and 41% are children under the age of 18 (UNHCR, 2009). Recent events have resulted in an influx of Iraqi refugees into the United States. Iraqis now comprise the second largest refugee group and in 2009. The United States accepted the highest number of resettled Iraqi refugees (UNHCR, 2009). It is not entirely clear why some refugee children are more at risk for adverse outcomes than others. It is possible that parental mental health, factors associated exposure to trauma as well as those associated with the resettlement phase can have far reaching effects on children of refugees. In addition to pre-settlement exposure to trauma, Iraqi refugees being placed in the United States must also contend with possible post-displacement exposure to stressors and what may be perceived as an unwelcome sociopolitical environment.

Objectives

The present study will explore the following questions 1) what is the psychological profile of children of Iraqi refugees 2) is the pre-settlement factor of maternal exposure to trauma associated with psychological symptoms in children of refugees and 3) is the post-resettlement factor of acculturative stress associated with psychological symptoms in refugee children and their mothers.

Methods

Participants were 218 (mean age: 38.7 years) mostly Catholic (81.2%) Iraqi refugee mothers and their children who were resettled into the United States within the last five years. Mothers were administered the 1) Harvard Trauma Questionnaire 2) Social, Attitudinal, Familial and Environmental Acculturative Stress Scale and 3) Child Behavioral Checklist and children were given the 1) Children's Depression Inventory and the 2) *Harvard–Uppsala Trauma Questionnaire for Children.* Children were between the ages of 6-13 (mean age: 9.8 years). 46.2% of child participants were female and 50.7% were male.

Results

Results indicated that 4.6% children reported depression and externalizing symptoms in the clinically significant range and 12.9% reported internalizing symptoms in the clinically significant range. Preliminary findings indicate that children's exposure to trauma was associated with depression symptoms (r= .22, p< .01) but not internalizing or externalizing symptoms. Maternal report of trauma exposure was associated with children's internalizing (r= .22, p< .01) and externalizing (r= .18, p< .01) symptoms. Mother's Post Traumatic Stress Disorder symptoms were associated with children's internalizing (r= .80, p< .001), externalizing (r= .76, p< .001) and depression symptoms (r= .18, p< .05). Additionally, mother's depression symptoms were associated with externalizing symptoms (r= .15, p< .01) in children.

Conclusion

The presentation included analyses that explored the relative contribution of maternal trauma, maternal psychological symptoms and maternal acculturative stress to children's psychological symptoms. Implications for clinicians, as well as community leaders will were discussed.

Building Public Health Workforce and Engaging Networks to Respond to Changing Priorities

Iman Nuwayhid, Rima Afifi, Jocelyn DeJong
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The Arab world has witnessed significant improvement in the indicators of public health over the last few decades. Life expectancy has increased for both men and women in all Arab countries, gender gaps in education have decreased though persistent in some areas and immunization programs have been effective in controlling many infectious conditions. Despite these positive improvements, the Arab world faces a myriad of current and future health and environmental challenges, some of which may even threaten its survival. The region faces a double burden of disease (non-communicable diseases together with reemerging and new infectious diseases), rapid changes in lifestyles impacting wellbeing, continued high fertility in many countries which will lead to a doubling of its current population of 360 million in less than 50 years, a worsening of the already strained water-scarce situation and a serious threat to food availability and security. In addition, the gains in public health and wellbeing have not been equal among and within countries, causing massive inequities that can destabilize communities. This changing situation is likely to lead to further urbanization and expansion of urban slums, competition for limited resources, and strain on the health care system and the health of populations. This is all framed against the backdrop of protracted wars, occupations, and civil conflicts that are engulfing many countries in the region, in a region that now houses the majority of the world's refugees.

Altering the challenging context described above requires bold and innovative approaches implemented by teams of public health professionals, in partnership with other stakeholders and communities. These professionals need disciplinary competencies, but more importantly need to be able to navigate the complex political and social context that surrounds and determines the health of people and the type and quality of its health care systems-- professionals equipped to work in complex, dynamic, and uncertain settings, and with a passion to carry the voice of the region and serve as change agents promoting values of justice and equity. A scan of the current regional institutions of higher education training the next generation of public health professionals suggests that most have not imbedded the requisite training, experiences, and values within their programs. Public health education remains mostly situated in traditional educational models that limit the scope, potential and power for action of its graduates.

This presentation expanded on the context of public health in the Arab world, the education and training of its public health professionals, and the governance and institutional structure within which public health professionals operate. The presentation promoted the call of The Lancet's Commission on Education of Health professional for the 21st Century for transformative education of health professionals across the globe and discuss the urgency and challenges of implementing the proposed model of learning and education. The presentation further argued for the critical importance of institutional networks that can learn from and support each other, thus elevating the impact of public health assessment, assurance and policy development. Finally, the presentation discussed examples of a few projects from the Arab world that have attempted to develop these new and innovative models, including the experience of the Faculty of Health Sciences at the American University of Beirut.

Conducting a BRFS survey of Arab/Chaldean population in Michigan

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Introduction

Although Arabs and Chaldeans are a large and growing population in the USA, especially in Southeast Michigan, which has the highest concentration of Arab and Chaldean Americans in the USA, until 2013 no national or statewide probability sample of Arab or Chaldean Americans had been conducted, making comparisons between the health status of Arab/Chaldeans and the general USA or Michigan population difficult. This presentation will discuss the methods used to conduct the first statewide probability sample of Arab/Chaldean American in Michigan in 2013.

Objectives or hypotheses

The objective of this study was to demonstrate the feasibility and efficiency of a surname-based sampling strategy for Arab/Chaldean Americans. We describe the development of a surname-database (Schwarz, 2007) and implementation strategy (i.e., a stratified sampling approach of the Michigan population) to produce a statewide probability-based sample of Arab/Chaldeans. We report on the first large scale application of the approach and its effectiveness.

Materials and methods

The Behavioral Risk Factor Surveillance System (BRFSS) is the world's largest ongoing telephone health survey. The BRFS was modified to be more suitable for the Arab and Chaldean populations in Michigan by adding questions about ethnic and national identity, immigrant and nativity status, language and literacy, acculturation, and access to health care.

Results

Survey results were 400 completed surveys (165 males/189 females), of which 201 were landline interviews. More than half (56.8%) of surveys were completed in Arabic. To the 400 interviews completed in the Arab/Chaldean BRFS, we added 136 interviews from the 2013 Michigan BRFS that were completed with individuals who identified themselves as Arab/Chaldean, bringing the total sample up to 536.

Conclusions

The approach was very efficient overall, with yield rates for three different geographic strata closely matching the expected yields based on Census profiles of tracts. It was also relatively inexpensive: we report on the costs. The surname database and approach appear to be sufficiently robust as to be applicable in other states or communities in the U.S. as well. Non-coverage issues are addressed in the context of cost considerations.

Healthcare Access and Insurance among Arab/Chaldean Americans in Michigan

Harry Perlstadt, Miles McNall and Larry Hembroff
Michigan State University

Introduction

Through the combined efforts of the Michigan Department of Community Health, Michigan State and Wayne State Universities, and the Arab Chaldean Center for Economic and Social Services (ACCESS) in Dearborn, MI, a telephone survey was conducted to learn more about the health status and access to care of Arab/ Chaldeans living in Michigan. Michigan is one of the few states which collects data on Arab/ Chaldeans since they are generally not considered a minority group. Although some are among Metro Detroit's wealthiest, many are immigrant/refugees with low household incomes.

Objectives or hypotheses

Controlling for gender, age, marital status, education, and employment Arab /Chaldeans living in Michigan are less likely than the general Michigan population and other minority groups (Blacks, Hispanics, Asians, and Native Americans) to have health insurance and access to care.

Materials and methods

The 2013 Michigan Behavioral Risk Factor Survey included an oversampling of 400 Arab/ Chaldeans conducted in either English or Arabic, and another 136 interviews from the 2013 Michigan BRFS. A list of Arabic surnames was created and was very successful in indentifying appropriate respondents on a random digit sample of both landline and cell phone numbers in Michigan geographical areas. The oversample BRFS survey was modified to include questions appropriate to this population: respondent's and family's country of birth, language spoken in the home, fluency in English and religious affiliation.

Results

Less than three-quarters of Arab/ Chaldean respondents said they had health insurance, which is lower than other Michigan respondents. However, they did have reasonable access to health care providers. About three-quarters reported their regular source of care was a private medical practice or doctor's office and less than one-third indicated that they did not see a doctor when they needed to because of cost.

Conclusions

This survey was conducted in 2013 just before Americans were required to purchase health insurance under the Affordable Care Act (ACA). As such, it can serve as a baseline for future surveys to assess the effect of the ACA on Arab/ Chaldeans in Michigan. The study may also serve as a model for other Arab/ Chaldean communities to build capacity in the area of health services.

Michigan's Arab and Chaldean Populations: Food, Smoking, Alcohol and Exercise

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Introduction

Especially in the last two decades, there has been growing attention to the positive attributes of Arab World cuisine and culture. Arab/Chaldean restaurants and stores are popular and positively regarded by many in the USA. Less studied have been issues of access to food, food security, consumption habits and their associated health outcomes within the Arab/Chaldean community in the USA. This paper builds on a pilot study and a telephone survey of Arab/Chaldean residents conducted by of the Michigan Department of Community Health, Michigan State University, Wayne State University, and the Arab Chaldean Center for Economic and Social Services (ACCESS) in Dearborn, MI, to learn more about the health status and access to care of Arab/Chaldeans living in Michigan, a state with a high concentration of Arab/Chaldeans residents. The paper will use a combination of interviews, field research, and the 2013 modified Behavioral Risk Factor Survey (BRFS) mentioned above to test hypotheses related to religiosity, length of time in the USA, and socio-economic status related to food consumption patterns as well as behaviors such as smoking and alcohol consumption.

Objectives

Our objectives are to establish evidence based findings on food security, food consumption patterns, other consumptive behaviors and health outcomes among Arab and Chaldean Americans. It is our hope to identify areas of policy and community intervention and areas of future investigation.

Materials and methods

Data from the Michigan BRFS conducted in 2013 included an oversampling of 400 Arab/ Chaldeans conducted in either English or Arabic, and an additional136 interviews from the 2013 Michigan BRFS. Culturally specific questions were included in the BRFS oversample. Data concerning nutrition, specifically fruits and vegetable consumption (reported weekly intake), alcohol (day of intake weekly, drinks per) and tobacco usage (cigarette and argile), and exercise were examined in relation to country of birth, and month and type of alcohol consumed, if any), exercise, and by religious affiliations.

Results

Preliminary results indicate relatively high average levels of food security, but that those with lower income in the Arab/Chaldean community are more likely to eat meat and not fruits and vegetables. Additionally, those who have more recently immigrated to the United States are more likely to regularly smoke. Religiosity was found to impact alcohol consumption. The effects of these behaviors combined with low levels of exercise are positively associated with levels of hypertension and diabetes among other health problems.

Conclusions

These results empirically document patterns that indicate the need for greater attention to diet and consumption behavior among Arab/Chaldeans. In particular, more effort is needed to investigate what accounts for lower consumption of fruit and vegetables and low exercise levels with the goal of developing programs to better address these areas of concern.

Family Communication and Cancer Literacy

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Introduction

Health literacy and the family can be used to promote cancer screenings. We examined the associations of socio-demographic factors, family communication, and cancer literacy in a diverse population.

Materials and methods

Baseline data from the Kin Keeper^{SM} Cancer Prevention randomized controlled trial were analyzed for Black (n=216), Latino (n=65), and Arab (n=235) women. Key variables were based on the Family Adaptability and Cohesion Scale IV, and the Cancer Literacy Assessment Tool.

Results

Among Blacks, cervical cancer literacy was positively associated with family communication. Cancer literacy was associated with higher educational level, employment, and family self-rated health status among Black and Arab women. Among Latinas, who were the least educated and had the lowest literacy scores, family communication was inversely related to breast cancer literacy.

Conclusions

Data suggest family-centered networks may be a viable resource for the transmission of health cancer literacy information, inform health care decision-making, and contribute to decreasing breast and cervical cancer mortality.

Age at menarche in relation to digit ratio and breastfeeding among high school girls in Kuwait

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Background

Early age at menarche has been linked to various adverse health outcomes such as, obesity, type 2 diabetes and breast cancer. Many factors are thought to be linked to early age at menarche, one of which is breastfeeding, but this remains under intense debate.

Objectives

To estimate the age at menarche among high school girls in Kuwait and to explore the association between age at menarche and breastfeeding or digit ratio.

Methods

A cross-sectional study was conducted on 810 randomly selected female high school students from all governorates in Kuwait. Data on age at menarche was collected by self-administered questionnaire by the students; while the data on breastfeeding was collected by self-administered questionnaire sent to their mothers. To calculate digit ratio (2D:4D), finger lengths were measured using a digital caliper. Weight and height of students were measured using digital scale and stadiometer. Multiple linear regression was used to investigate the association between age at menarche and breastfeeding or digit ratio.

Results

Out of the 810 students selected, 50(6.2%) were absent or refused to participate, and out of the 761 mothers to whom the questionnaire was sent, 433(56.9%) responded. The mean (SD) age at menarche was 12.32(1.21) years (95%CI: 12.23-12.41). There was no significant association between age at menarche and breastfeeding in the first four months of life before and after adjusting for potential confounders. There was no significant association between age at menarche and digit ratio in either hand before and after adjusting for potential confounders.

Conclusion

The estimated age at menarche among contemporary girls in Kuwait is similar to that in industrialized countries. Trends in age at menarche should be monitored because of their public health implications; and cohort studies are recommended to investigate if breastfeeding has a spinoff benefit in terms of delaying sexual maturity.

Reasons for Consultation among Patients attending Primary Healthcare Centres in Oman

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Background

Health care systems make plans for efficient utilization of services they provide. However, such plans will face implementation difficulties without exploring factors that affect individual's decisions to seek health care. The aim of this study was to find out factors that affect Omani patients' decision to seek health care facility help and the amount of effect these factors have on such decision.

Methods

The study was done in 11 villages from five regions in Oman. Data was collected by medical students through face-to-face interview with participants from the community and those attending health centers.

Results

The total number of participants was 741 (61% female). One third of them had history of chronic illnesses. Interestingly, out of 12 factors, doctor's advice was listed by 84% of participants as a factor affecting decision to use health centre compared to off work/study which was listed by 23% of participants. Furthermore, 92% of participants stated that increased severity of symptoms had strong effect on decision to use health centre compared to reading health education material which was stated to have strong effect by 45% of participants. Impact of each factor was found to be affected by variables such as age and history of chronic illness. For example, fear from dangerous diseases was valued more by those with history of chronic illness compared to participants with no such history (65 versus 52%; $p<0.000$).

Conclusions

Health-seeking behavior is affected by various factors that need to be explored in order to positively modify such behavior.

Prevalence of unnecessary injections and population beliefs about the efficacy of injections in Egypt, 2013

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Introduction

Many studies identified receiving injection as risk factor for transmission of hepatitis B and C which constitute major public health problems in Egypt. Malpractice and unnecessary injections are common in Egypt. A study conducted in Egypt estimated frequency of injection use as 26.2%, with average 4.2 injections/person/year. This study aims at estimating prevalence of unnecessary injections in Egypt and identifying beliefs regarding injections.

Methodology

A cross-sectional study was conducted in 4 governorates representing the 4 areas of Egypt. Five primary health units (PHUs) were randomly selected from each governorate. A tool developed by WHO was used to identify unnecessary injections, assess knowledge and beliefs of injection- prescribers, providers and health-care seekers in the PHU. In addition, prescriptions from the previous 3 months were revised to calculate prevalence of unnecessary injections. Injection was considered unnecessary if there were oral alternatives or did not match the Egyptian Family Medicine treatment Guidelines.

Results

A total of 20 prescribers, 40 injection providers and 400 health-care seekers were interviewed and 600 prescriptions were revised. Prevalence of injections prescribed was 19% (95%CI 16-23%); of them 62% (54-71%) were antibiotics. Rate of unnecessary injections was as high as 93% (CI 85-96%). Among the 20 prescribers, 85% thought that they do not prescribe injections a lot. Less than half of physicians mentioned 2 diseases that could be transmitted through injection. Injection providers mentioned that they give a mean of 15±15 injections/day including 12±SD for vaccination. Among health-care seekers, 49% had injection in the last three months, with mean of 6.4 injections, of them 29% preferred injection to other types of treatment. Almost all (96%) knew that unsafe injections can transmit diseases, 46% mentioned HCV, 23%HBV and 24%HIV.

Conclusions and Recommendations

High prevalence of unnecessary injections was identified in Egypt PHUs. Injection-prescribers had low knowledge about diseases transmitted by injection, while most of them think that they do not prescribe unnecessary injections. Prescribers need to be trained and followed up for compliance to treatment guidelines.

Exposure to major social stress and health: Setting a research agenda for the future

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In this presentation, THE INVESTIGATOR discussed the role of major social stresses in relation to health and well-being. THE INVESTIGATOR used the framework of social determinants of population health to review our understanding of how major social stress affects health outcomes across the life-course. A large body of scientific research provides evidence that stress associated with social disadvantage and adverse social experiences is associated with poorer health and well-being. Key themes in this research have focused on economic indicators of social stress, including poverty, lack of stable employment, and low social status; social isolation and perceptions of personal and institutional forms of discrimination; living in unsafe or impoverished environments; and traumatic personal experiences associated with various forms of abuse and loss of close relatives and friends. This research was used to inform a future research agenda addressing major sources of social stress relevant to public health to Arab-origin populations in the Arab region itself, and those that have moved to other countries. Initial steps in this research needed to enumerate and quantify the major sources of social stress in Arab populations. Building on previous research, likely candidates of major social stress involve the changing population composition and structure in Arab nations; disparities in the distribution of wealth and economic opportunity; adoption of non-traditional behaviors and social norms; and exposure to armed conflict, and dislocation as a result of armed conflict. Of particular urgency will be to conduct systematic investigations of the growing refugee populations in the Arab region, and to identify and deliver the resources necessary to alleviate the social stresses and significant health risks of this population. The success of these efforts will depend importantly on collaborative engagements with affected populations using community-based participatory research strategies, while building coalitions with and among local investigators and institutions, and other relevant stakeholders that aim to improve the public health of Arab populations. Another promising area of research is to begin comparative investigations of the most important social determinants of health and well-being in Arab Americans and Arab populations living in the Middle-East North Africa (MENA) region.

Integrated health data for global bio-preparedness and response

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Introduction

We have recently developed an integrated health data system to enhance bio-surveillance, situational awareness, emergency preparedness and response. This data system is a live, interactive, multi-state production system to integrate near real-time data and analysis. The system is the result of a unique partnership that promotes collaboration between health systems across the pre-hospital, hospital and poison center care settings. In addition, the platform allows for integration of data from other global sources (veterinary, environmental, emergency management and census) as well as social media. Thus, the platform for the exchange, analysis, integration and dissemination of near-real time data across global populations, as well as targeted geographies.

Goal & Objectives

The goal of this integrated health data approach is to enhance bio-preparedness through time-sensitive data collection and analysis to provide actionable information on emerging health threats and public health emergencies.

Methods

The data system platform provides information services that analyze and integrate data across a variety of domains, including clinical, social media, and physical data. The system currently gathers over 13 million health records that are close in time (12-24 hours) to events of interest, in particular emergency medical services, poison centers, and social media records. Applying advanced visual and statistical analytics, the system provides a dashboard with multiple views across time and place ('pods'). It weighs the informational value of each pod by including data quality on timeliness and completeness of the data across a number of metrics in a data volatility score for each data source. Both real outbreaks and simulated outbreaks are examined by the pods to test system validity.

Results

The system detected, and validated across data sources, the magnitude of 2012-2013 influenza epidemic three months prior to recognition by current statewide and national public health surveillance systems. Furthermore, data from a field test with simulated outbreaks of MERS-CoV inserted into real time data provide a demonstration of system functionality across multiple users, including paramedics, nurses, physicians and public health officials.

Conclusion

This integrated health data system supports multiple views of emerging health situations across time, location, and analytic methods. Use of timely data from multiple sources can rapidly corroborate information. This integrated approach to health data allows for clinically meaningful interventions, as well as, investigative actions during emerging outbreaks and public health emergencies.

Community-Based Health Promotion: Experiences and Best Practices

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Introduction

Over the past half century, community-based health promotion (CBHP) has cemented itself as a critical field of health education, recognizing that an individual and their health cannot be considered separate from their environment. Through its emphasis on local participation, equitable partnerships, community capacity building, and empowerment, CBHP has distinguished itself from other health promotion activities in its vital contributions to the health of a population. An empowered community is that which possesses the capacity and determination to address health problems affecting its members, thus allowing individuals to gain increased control over their health choices. Evidence based research in epidemiology and sociology has shown various associations between powerlessness and mental and physical health. CBHP programs add the element of community ownership to health education initiatives, encouraging individuals to participate in building healthier communities.

The American Near East Refugee Aid (ANERA) has a proven history of empowering Palestinian and Lebanese communities to build better foundations for health. In Lebanon, ANERA's work has centered within Palestinian refugee communities that have long struggled with the most difficult socioeconomic and health conditions in the Middle East region.

Objective

The objective of this piece is to highlight ANERA's experiences and best practices in CBHP through sharing examples of its most successful programs within communities in need in Lebanon.

Methods

ANERA's CBHP programs have extrapolated from the ecological model to approach health problems in a multidisciplinary fashion while employing multiple intervention strategies in emergency and non-emergency situations. Such programs include raising awareness in the identification and treatment of lice and scabies, responsible use of medicine, anabolic steroids, nutrition, personal hygiene and winter illnesses. Through rigorous formative research, community needs were self-identified and informal approaches were used in highlighting common misconceptions.

Community members and peers whose life circumstances resembled those of the beneficiaries were trained on health topics and delivery methods. The concept of role modeling was employed, where trained individuals set examples by demonstrating the effectiveness of positive change. Entry points used were schools, mosques, cafes, local community centers, among other social settings. This targeted approach, along with providing appropriate tools, focuses on offering solutions rather than merely highlighting a problem.

Results

A combination of both quantitative and qualitative assessments was used to assess project impacts, and showed positive results in all endeavors:

- Improved knowledge on nutrition and personal hygiene topics, as well as in adopting better practices for avoiding winter illnesses.
- High treatment success rate for lice and scabies among schoolchildren.
- Improved knowledge and attitudes on sports nutrition and the dangers of anabolic steroids.

Conclusions

Working within emergency settings poses great challenges, in that it is difficult to measure long term impacts among continuously mobile refugee populations. However, valuable lessons have been learned through ANERA's CBHP programs. Drawing on existing community resources generates local ownership and allows for sustainable programs. Delivering messages through community practitioners and lay participants, while engaging people in their own settings builds trust and acceptance of a project, improves willingness to change, and builds skills for protective health behaviors.

Social environments and population health: Arab-Americans and beyond

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The 'environment' has long been recognized as an important influence on population health. Yet much of the literature that has interrogated the health influences of the environment has focused on its role in directly patterning harmful physical exposures. However, over the past 20 years, a growing body of work has documented the health influence of the social environment—the collection of economic, racial, ethnic, and political features of spaces that shape the social norms, values, and objectives of communities inhabiting them, as well as the physical characteristics they manifest. This literature has demonstrated the roles that diverse social environmental features, such as racial and socioeconomic segregation, ethnic enclaves, and blight may play in the etiology of a number of outcomes, including chronic disease, psychopathology, and mortality, as well as the various mechanisms through which these social environments may 'get under the skin'. In this work, we have a) explored the various manifestations of the social environment and its implications for population health, and b) considered the mechanisms by which the social environment may influence health. In service of these aims, we dissected several examples of recent studies from the literature about Arab-American health considering the role of co-ethnic density in the etiology of low birth weight and suicide among this group.

Global Health Institute Partnership with Middle-Eastern Institutions and Organizations

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Introduction

The Global Health Institute (GHI) is dedicated to finding evidence-based solutions to global health problems through the education of tomorrow's health leaders. The GHI is a unique partnership that promotes collaboration between the University of Arizona and partner universities and organizations. The GHI also serves as a platform for the exchange and development of ideas, a place to identify potential research partners, and as a central hub for all individuals or entities interested in exploring the health of our world.

Goal & Objectives

The GHI's main goal is to prepare a globally trained, inter-professional workforce by offering outstanding global health training programs for students and health care professionals through a number of courses and research programs designed for local and international scholars.

Methods

The 4-week summer research training program introduces medical students to the public health system in the U.S. through practical hands-on experiences in biomedical and public health research and the laboratory. The program utilizes a combination of applied experience, role model mentoring and collaboration, and networking skill building to provide a supportive environment that maximizes the likelihood of success. Each student is matched with a faculty member from the College of Public Health and the College of Medicine for one-to-one instruction. Laboratory experiments provide students with hands-on experience in basic research to understand disease mechanisms, learning about disease biomarkers such as gene sequencing, and innovative therapeutic approaches. In the culminating session, the students orally present and discuss their research contributions in an electronic poster format.

Results

The partnership between the University of Arizona and Al-Imam University started in 2011. During the last 4 years (2011-2014), forty medical students (29 males and 11 females) have participated in the GHI summer research training program. All students took the human subjects training and passed the CITI testing. Students presented their research projects as posters and/oral presentations in open forums and/or international conferences. The evaluation surveys showed that students appreciated meeting with different professors and learning from them, the work environment experience in a different country, the exposure to the health care system in the USA, and the opportunity to visit different community health care centers.

Conclusion

The students of Al-Iman University College of Medicine developed an understanding of the interactions between public health and biomedical research. Furthermore, they gained the knowledge of providing the highest possible standard of care for the community while participating in projects aimed at preventing cancer, developing treatments for Alzheimer's disease, and conducting environment exposure assessments. The program is becoming very popular and we are extending it to other universities in the Arab World and beyond.

Building Global Capacity for a Highly Functional Nursing Workforce: University of Arizona College of Nursing U.S. Perspectives

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Introduction

While in many developing countries nursing has been seen as a profession of low status relative to some other health science disciplines, of late, more healthcare leaders have recognized the important role that a highly functioning nursing workforce plays or can play in assuring high quality healthcare. An essential view is to see nurses as not just on teams providing critical/acute recovery care within hospitals but also on teams providing ongoing and preventive care in the community and home. In the U.S., nurses represent the largest health care profession group (≈ 3 mil) and are playing an ever-increasing role in helping people manage chronic diseases and medical regimens and engage in self-care that will achieve optimal health for populations. U.S. nurses are educated at a basic (registered nurse – RN- licensed) as well as an advanced level (advanced practice RN licensed - APRN) to deliver team-based care across multiple venues, e.g., hospitals, community health clinics, among others.

Objective

The objective of this paper is to outline: 1) how U.S. nursing education has evolved, 2) key dynamics of U.S. healthcare influencing health sciences education, 3) the health ecology framework for framing nursing curricula and science in the context of U.S. healthcare delivery, and 4) an example and thoughts about potential global nursing partnering strategies.

Review

Nursing education has evolved to encompass basic education that conveys eligibility to attain a registered nurse (RN) license through to advanced practice nursing through earning a practice doctorate or PhD. Key U.S. healthcare dynamics driving the need for higher levels of health professional education include aging of the population, more chronic conditions, growing medical diagnostic, treatment, information and healthcare delivery technologies, more community-based acute care, and a call for disease prevention and health promotion. Increasing emphasis has been placed on team- and evidence-based care for advancing safe and high quality of care. Nursing practice and science places emphases on understanding individuals or groups in the context of their environments – a health ecology framework. It is the dimensions of considering people in the context of their environments and coaching and guiding patients in their self-care that is the essential complement of nursing practice to biomedical-driven practice. For global nursing development, University of Arizona (UA) nursing faculty commitment is to help advance nursing practice across cultures. A current exemplar initiative involves UA Nursing faculty members serving as capacity-building consultants to faculty at the University of Tabuk (UT) in the Kingdom of Saudi Arabia (KSA).

Conclusions

Through cross-culture nursing school partnerships, many cooperative capacity-building initiatives can be envisioned. Besides the commonly adopted faculty and student exchanges and access to various degrees offerings, UA nursing faculty are frontrunners in in using online technology to enable learning. Online offerings could be coupled with UA onsite or partner onsite experiences or infused into partner courses. Learning modules could be cooperatively designed on topics of mutual agreement and delivered by UA and partner school faculty dyads. The possibilities for global nursing capacity building enabled through online and onsite learning allows for many novel ways to partner across distances.

Designing a public health workforce development program in a complex context: challenges and potential solutions

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Introduction

Improving health and population health outcomes depends largely on the availability of qualified health workers. However, most of the 'public' health workforce in the Arab region has no formal training in public health, and thus has difficulty responding to the health needs of populations from a comprehensive, multidisciplinary perspective, taking social determinants into consideration and employing a systems approach to designing solutions and other interventions. Hence, evidence- and competency- based workforce development is critical to enhance capacity of these human resources of public health.

Purpose

The Center for Public Health Practice (CPHP) at the Faculty of Health Sciences (FHS) in the American University of Beirut engaged in an exercise for workforce development (WD). The original plan was to identify key priority health issues and build relevant training programs around them. However, our scan of the literature and websites indicated a lack of assessment of the training needs of public health human resources; wide disparities in indicators of morbidity and mortality across countries of the region with few defined and different priorities; and contextual challenges of rapidly changing health situations on the ground due to uprisings, conflicts and wars. This observation resulted in a shift in emphasis from priority health issues to skills/competencies needed to carry out the tasks of public health.

Methods

CPHP adopted framework developed by the Council on Linkages Between Academia and Public Health Practice and adopted it to our context .We categorized the public health human resources working in the region into categories each with a set of specific skills. The center elected to focus its training programs on two entities for the coming two years: External, targeting policy implementers working in primary health care settings, NGOs and ministries; and internal, targeting undergraduate students from different majors including environmental health. For policy implementers, who undertook training on Program Planning, the outputs of the trainings have shown improvement in participants' knowledge in identifying needs of communities, setting priorities and develop action plans. As for students they were able to apply specific life skills during the training and community engagement projects.

Conclusions

Within the context of uncertainty in the region and rapidly changing environments affecting health of populations, and the insufficient knowledge on the training needs of the workforce, this framework serves as a tool to guide the planning, design and implementation of training programs. The outcomes of the trainings have yet to be measured in order to test the effectiveness of this framework and its use.

Low birth weight in Jordan: Prevalence and associated risk factors

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Background

Birth weight (BW) is a good indicator of maternal and neonatal nutritional status, and contributes to the newborn baby's survival, growth, long-term health and psychosocial development.

Aim

To estimate the prevalence of low birth weight (LBW) in Jordan and to identify the associated risk factors.

Methods

This retrospective study analyzed medical records to determine the prevalence and possible risk factors associated with low birth weight in the Irbid governorate of Jordan. The study was approved by the Institutional Review Board at Jordan University of Science and Technology and the Ministry of Health in Jordan. All singleton births during the year 2011 were reviewed. Abstracted data included mother's age and educational level, and monthly family income. Newborn information included birth weight, gender and birth order.

Results

A total of 6237 singleton births were included. Of these 1191 (19.1%) were low birth weight, 4759 (76.3%) were normal birth weight, and 287 (4.6%) were high birth weight. Factors associated with low birth weight were first born babies, lower maternal age (less than 25 years), lower educational level, and lower family income (< 500 JD)

Limitations

The findings can be generalized to singleton pregnancies in countries who share similar cultural and traditional values. Conclusion: Education of mothers is a modifiable variable that can positively influence BW.

Implication for Nursing and Health Policy

The findings inform our understanding of some social factors affecting BW of neonates in Jordan and development of effective public health interventions for at-risk mothers.

Partnerships for Health across borders: Facing challenges in complex settings

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Introduction

The Outreach and Practice Unit (OPU) of the Faculty of Health Sciences at the American University of Beirut in Lebanon has forged a solid partnership with UNFPA Iraq since 2011 aiming to provide technical assistance to Iraqi governmental and non-governmental organizations in the area of reproductive health and youth programming. We discuss challenges and opportunities in a tri-partite partnership across borders to develop health programs in a country going through post-war recovery with continuous security threats.

Methods

Continuous monitoring and evaluation of project outcomes as well as annual programmatic review, indicated barriers and facilitators of success in project implementation. This data was documented in minutes, reports, and through discussions with partners.

Results

Challenges included difficulty in keeping open channels of communication and coordination between the three partners, differential conviction of the importance of participatory planning, unclear understanding of the roles and context of each partner, rapidly changing needs on the ground, rules/goals of foreign policy that impede public health action, and others. Inequities are more exacerbated by the complexity of the security situation in Iraq where some regions, despite their potentially greater needs, are left behind due to the existing higher security threats. These challenges limited the ability of the program to tackle root causes of ill-health by diverting focus towards dealing with operational details. Facilitators included common commitment to promoting health in the Arab region, mutual perceived benefits of the partnership, alignment of objectives, joint planning, shared responsibility and accountability, flexibility and constant evaluation.

Conclusions

Sustainable and robust partnerships between stakeholders are particularly important in contexts of intense uncertainty and lack of stability. Constant critical reflection and analysis in relation to the partnership itself as well as to the achievement outcomes is essential if we aim to promote the ultimate goal of public health – enhancing justice and equity.

"Building foundation and roof simultaneously". The equity challenge in conflict-ridden Iraq's National Child Protection Policy

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Introduction

Violence and abuse are some of the most pervasive issues facing conflict and post-conflict societies. Children are particularly vulnerable to abuse and exploitation in communities that have been shattered by displacement and death, and where informal societal structures and formal governmental services providing protective measures, are weakened by years of conflict and instability. This work aims to develop a national child protection policy in the contexts of such challenges.

Methods

A review of legislation and practices was performed. An evidence-based approach to developing the policy on child protection was applied, allowing identification of gaps in evidence. Qualitative data collection supplemented available information through interviewing key concerned stakeholders at the policy making level.

Results

The following barriers to effective policy response were identified. In working to build the 'foundation', the government looks to legislation as an overarching medium, yet legislation reflects a tradition of punitive measures, disempowering perceptions of children, and is not complemented with mechanisms supporting enforcement, and monitoring. Additionally, although the government holds itself accountable to providing equitable services to protect all children, it is driven into reactive intervention responses, resulting in lack of attention to underlying causes. Though numeric data is abundant, information into the reasons behind the gaps in the system, the cultural or historic roots of some underlying causes, and unpacking the relationship between the government and societies characterized by tribal structures, all essential to inform an equitable policy, proved difficult to determine without participation at the community level, including from children and families.

Conclusions

The role of governments is intrinsic to creating sustainable systems that promote equity for all vulnerable groups. To be effective and inclusive, the process requires historical and anthropological understanding of society and systems, and an organic development of a model that is receptive to recovery attempts of a post-war country.

U.S. Training of Clinical Pharmacy Faculty: Kingdom of Saudi Arabia Experience

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Introduction

As many countries around the world move towards a clinical model for pharmacy practice and education, there is a growing need to develop well-trained clinical faculty, preceptors and practitioners. Since clinical pharmacy education and practice has existed in the U.S. for many years, students and faculty in other countries are seeking U.S. clinical pharmacy education and training.

Purpose

We describe a program developed by the University of Arizona College of Pharmacy for junior clinical pharmacy staff from Colleges of Pharmacy and leading hospitals in the Kingdom of Saudi Arabia (KSA).

The program is provided under contracts funded by universities and the KSA government. It is designed to provide broad, high level clinical pharmacy and pharmacy education experience. This is a two year program, with an option of a 3rd year and takes place in Tucson, AZ USA.

Methods

Trainees are enrolled as Graduate students in a Graduate Certificate program to facilitate immigration. Year 1 activities will include preparation for and completion of an equivalency exam and internship rotations in order for trainees to become licensed pharmacists. Year two will be postgraduate year one residency training, and optional year three will be postgraduate year two specialty residency training. After completion of the program, some trainees have entered a post-residency Fellowship program to enhance their research skills. After completion of the programs, trainees will return to KSA to serve as faculty members or clinical pharmacy specialists. While some barriers to successful completion of the program have been identified, particularly the English language requirement for licensing foreign pharmacy graduate, almost all are successfully progressing through the program. Since the capacity for training foreign pharmacy residents is limited, other strategies such as short-term training programs and assistance with development of local residency programs also may be considered.

Conclusions

This program could serve as a model for other collaborative clinical pharmacy training programs with other Middle East countries, including the development of a multinational training consortium of Gulf countries.

Cooperation in Cancer Control in Middle Eastern Countries: Role of Cancer Associations

Michel Daher

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Introduction

Cancer have gained a marked public interest since disease is synonymous with death & suffering, and has led to the development of cancer societies, associations, and patient support organizations in almost all countries. Their activities depend on what is or is not done by governments or other professional organizations.

Objectives

The cancer burden and cancer patterns reflect the way we live, and many changes in cancer incidence are due to changing patterns of life. Thus, the cancer burden is not a fixed entity but can be reduced by focused intervention. The role of cancer organizations is of great importance in this field.

Main fields of cooperation in ME Countries

Cancer prevention and early detection: Research may not yet have identified all the causes of cancer but has already provided evidence that modifiable determinants of risk account for about one-third of all cancers. Prevention and early detection can thus play a major role in saving lives.

Capacity building: The main objective of cancer organizations is to fight cancer. They are therefore a key force in encouraging governments to develop comprehensive cancer control programs. To reduce the burden of cancer, health-care providers, policy-makers and NGOs must concentrate their resources on avoidable risk factors and early detection.

Importance of advocacy and lobbying: One of the core responsibilities of cancer organizations is to provide information. Information alone is unlikely to change behavior, however, and information campaigns are very expensive. Therefore, a considerable part of NGO resources should go to advocacy and lobbying.

National cancer control programs: In order to succeed, national cancer control programs must become powerful, effective and cost-effective. The best means is to build large coalitions and involve partners from many sectors of society. Decision-makers in the fields of politics, economics, NGOs, and society at large must be convinced to work together to promote a healthy environment and healthy life styles.

Priorities & Challenges of an Effective Cancer Association/ Society

From the Perspectives of the Lebanese Cancer Society, these are the priorities where an NGO have a predominant role:

- Role in Information and Education → Prevention and Early Detection
- Role of Education and Continuing Medical Education: → Improve Quality Care
- Role in Patient Support → Better Quality of Life
- Role in Advocacy and Capacity Building → National Cancer Control Programme

These are some examples where cooperation succeeded in fighting cancer in the ME countries:

- Middle East Oncology Congress (COMO), organized by the Lebanese Cancer Society
- Middle East Cancer Consortium (MECC)
- American Cancer Society University (ACSU)
- International Union Against Cancer (UICC)
- IARC (WHO)

Conclusions

In many developed countries, cancer societies have significantly improved cancer incidence, mortality, and quality of life. Their counterparts in developing nations – though often understaffed and under-funded – fill a similar niche. These dedicated cancer control professionals work diligently to meet whatever needs their governments are leaving unmet. There is a need for supporting of the inspirational work of these organizations and empowering them to do more to ease the cancer burden in their countries.

From Silos to Systems: Partnering for Health Equity in Underserved Communities

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Introduction

In 2012, 53% of the refugees that arrived to the state of Michigan (USA) settled around Macomb County. Seventy five percent of the arriving refugees were Iraqi, 56% did not speak English, 50% had less than a high school diploma and were unemployed or under employed.

Additionally, many arrived with existing physical and mental health concerns including extremely high rates of post-traumatic stress disorder (PTSD) and medical negligence which preceded their arrival to Macomb County.

Issues and Concerns

The conflation of these numerous issues contributes to health disparities and creates unique needs for families and the providers seeking to serve them.

Methods

To meet these needs, a collaborative model in Macomb County, Michigan (USA) between governmental public health and community services was developed. Focusing on culturally appropriate and community based services, this shared model integrated principles of health equity and community organizing, resulting in significant increases in service utilization and participation. Notable outcomes include service to over 2000 women and children from minority populations through the Women Infant and Children Program (WIC), enrollment of hundreds of families into affordable care health plans and mobilization of a volunteer network through a local senior nutrition program. We describe the process undertaken between ACCESS Community Health & Research Center and the Macomb County Health Department (MCHD) and the resultant public health service integration.

Conclusions and Outcome

In partnership with MCHD, ACCESS, a fully integrated one-stop service center that provides culturally sensitive and bilingual medical, public health, mental health and environmental health services targeting the Arab and refugee community in South East Michigan established a model shared of resources and strategies. Components of this health equity driven community partnership are described, including organizational and community characteristics of readiness, power, social justice, and social and cultural alignment. Relevant examples and applications will be presented.

Social inequalities in health during times of "economic prosperity": Lebanon, Syria, and Palestine in the first decade of the twenty first century

Sawsan Abdulrahim, Emily Field, and Khalil El Asmar
American University of Beirut

Background

In the Arab region, perpetual political conflict has stymied serious debates about the relationship between social inequalities and health. Yet, as the mass protests sweeping the region in the past few years have shown, political conflict is both a cause and a consequence of underlying inequalities that inevitably determine the patterning of health outcomes.

Purpose

In this study, we examined the social gradient in health status in three Arab countries (Lebanon, Syria, and Palestine) during the first decade of the twenty first century, a time of "post-war reconstruction" (Lebanon), "modernization and economic prosperity" (Syria), and "peace negotiations and donor funding" (Palestine). This was also a decade of rising social inequalities.

Methods

The study utilized nationally representative data gathered by the Pan Arab Project for Family Health (PAPFAM) on women of reproductive age: Lebanon (2004) N = 3499; Syria (2001) N = 6954; Palestine (2006) N = 5098. We used self-rated health status (SRH), measured on a 3-point scale (poor, fair, good), as the outcome, and education and household economic status (household income or wealth) as proxy indicators of SES. We ran logistic regression models to test for the association between SES and SRH, adjusting for demographic and health behavioral factors.

Results

Our findings revealed the following associations: 1) a strong negative education gradient in SRH in all three countries under study; 2) a clear negative wealth gradient in SRH in Syria and Palestine; 3) a threshold association between income and SRH in Lebanon (only the poor, but not the middle income, exhibit poorer SRH status compared to the highest income group).

Conclusions

The findings highlight that poor SRH status in the Arab region is not only an outcome of poverty but also of inequalities that cut across the SES gradient. In the paper, we discuss the implications of our findings in the three Arab countries in light of the forces that have been negatively affecting the living standards and wellbeing of the middle-income segment of Arab populations and in light of the social epidemiological theories proposed to explain the social gradient in health.

Training the Next Generation of Cleft and Craniofacial Surgeons in Palestine

John Van Aalst
Cincinnati Children's Hospital

Background

Our research group has defined the incidence of clefting in Palestine, (1) and is actively working on defining unique genetic anomalies that cause clefts among Palestinians. (2) As part of the foundation of understanding the incidence and impact of congenital anomalies in the Occupied Palestinian Territories we have developed a congenital anomalies database (Palestinian Congenital Anomalies Database) based on a 700-question survey. This abstract presents the initial results of our survey.

Methods

In 2010, we obtained IRB approval from the University of North Carolina at Chapel Hill, and from Birzeit University in the West Bank to administer a face-to-face validated 700-question survey in colloquial Arabic to mothers of children with congenital anomalies. Demographic information included all aspects of patient and family health histories, family social circumstances, diet, and environmental exposures; care during pregnancy, and subsequent surgical care for affected children.

Results

At present there are 954 distinct patients in the database, with 239 completed surveys. Of completed surveys, demographic patient findings include the following: 51% female and 49% male; predominant diagnoses were cleft lip and palate (204), microtia (18), and other (15). Among those with cleft lip and palate, 16% had cleft lip only; 28% had cleft palate only; 43% had cleft lip and palate. The majority of patients with cleft lip ± palate were male (60%), and those with cleft palate alone were female (65%). Nearly three quarters of mothers (74%) received ultrasounds (US) during their pregnancy. However, only 11 percent (17/152) of patents with cleft lips were detected by US. Though only 4% of mothers reported smoking during pregnancy, 65% of mothers reported living with a smoker during pregnancy, with 89% of this group reporting daily exposure. Among patients with clefts (n=204), 26 had immediate relatives with clefts (parents, siblings), 74/204 (36%) reported a more distant family member with the diagnosis of a cleft. Among parents, 61% reported being related to their spouse, with the vast majority (59%) being first cousins.

Conclusions

This first report form the Palestinian Congenital Anomalies Database suggests a distribution of clefts that is consistent with other large population studies (preponderance of cleft lip diagnoses in males, and cleft palate diagnoses in females). Though most mothers received US during pregnancy, very few of the babies with cleft lips were actually diagnosed by US. A significant percentage of mothers report daily exposure to second hand smoke. A majority of parents with children with congenital anomalies report consanguineous marriages. This initial report lays the foundation for improved understanding of congenital anomalies among Palestinians.

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Public Health Education Opportunities at the University of Nebraska Medical Center

Jane Meza
Omaha, Nebraska

The University of Nebraska Medical Center (UNMC) is the only public educational institution devoted to health sciences in the state of Nebraska. Building on a rich and vibrant history that dates back to the last quarter of the 19th century, UNMC remains committed to its mission of improving the health of Nebraska through premier educational programs, innovative research, the highest quality patient care, and outreach to underserved populations. The College of Public Health has rich academic and professional programs including a Master of Public Health accreditation by the Council on Education for Public Health (CEPH). The UNMC College of Public Health offers a wide range of programs and degrees to provide students with a comprehensive, well-rounded education in public health. The educational programs are designed for students who wish to pursue different levels and approaches to public health education, including certificate programs--the certificate of public health, professional degrees--the Master of Public Health, specialized academic degrees--the Master of Science and the doctor of philosophy. The College of Public Health took a lead role with the Nebraska Method Ebola educational courses for clinicians and the general public. Additionally, the College of Public Health is the first in Nebraska to design a massive, open-access, online course on Health Literacy and Communication for Health Professionals, currently seen by 9,400+ people in 171 countries.

Socioeconomic Determinants of Exposure to Second Hand Smoke Among Pregnant Women

Ahmad Almahdi
King Khalid University Hospital

Background

Secondhand smoke (SHS) exposure is a worldwide problem that threatens human's health. It is considered a major risk factor for many diseases, affecting all ages. Specifically, exposure to SHS in pregnant women is harmful to both the infant and the pregnant women. Furthermore, the effect of the exposure to SHS in the pregnant women can lead to permanent deformities in the infant that can't be cured. Respiratory, cardiovascular and central nervous system and other systems abnormalities can happen.

Objectives

The purpose of this study is to define the prevalence of SHS among pregnant women in King Khalid University Hospital (KKUH) in Riyadh, Saudi Arabia. To determine the association between the demographic characteristics (age, parity, level of education, employment and level of monthly income) of pregnant women and their exposure to SHS in the antenatal clinic in KKUH. Moreover, to determine the amount of knowledge of the pregnant women in KKUH about the harms of the exposure to SHS on the adult health and specifically on the health of babies.

Methodology

This study was conducted in the antenatal clinic, King Khalid University Hospital, Riyadh, Saudi Arabia. It is a prospective cross-sectional study investigating the determinants of exposure to SHS during pregnancy and to evaluate the knowledge of the pregnant women about the harmful effect of SHS. The data were collected from a consecutive sample by using a questionnaire and were analyzed by using SPSS, version 21.0.

Results

The study showed the prevalence of SHS exposure among the pregnant women at 24%. Low level of education is associated with more exposure to SHS, p-value=0.039. Also being unemployed is associated with more exposure to SHS; p-value=0.02. There was no association between maternal parity, age, or socioeconomic status and exposure to SHS, p-value> 0.05. Participants were more knowledgeable about the harmful effects of SHS exposure on adults than fetal or infant health.

Conclusion

Maternal education level is a determinant of SHS during pregnancy. Pregnant women knowledge about the specific harmful effects of SHS on the fetal and infant health is modest.

Impact of Air Pollution on Asthma in Arab Americans

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Introduction

Little is known about environmental asthma triggers in the rapidly growing population of Arab Americans in the United States.

Objectives

To determine whether there is an association between changes in air pollution and asthma symptoms in young and old Arab Americans, respectively.

Hypothesis

The winter season, as opposed to the summer season, is associated with worse self-rated and objective pulmonary function.

Materials and methods

A group of young (n=71; mean age 11.5 years; 33 boys and 38 girls) and old (76; 64.6; 28 men and 48 women) Arab Americans in metro-Detroit, Michigan, US, with physician-diagnosed asthma were identified. The survey covered socioeconomics, self-rated health and pulmonary function, health care utilization, and environmental exposures during the summer of 2013 and the winter of 2013/2014. Participants completed respiratory function tests. Air samples were collected and analyzed for particulate matter ≤ 2.5 μm in aerodynamic diameter ($PM_{2.5}$).

Results

Every third young and every fifth old participant lived under financial hardship; household income < $20,000. A majority of young persons were in school, but 45% of the old group lacked formal education, and only 13% were employed. Self-reported respiratory health was reported to be poor or fair by 32% of the young and 70% of the old participants. Both groups reported having worse asthma symptoms in the winter. This concurred with higher levels of air pollutants. Colds/flu, air pollution, and smoke were the most common triggers of asthma. During the winter, 34.2% of the young and 22.4% of the old were hospitalized for asthma as compared to 5.6% and 18.3% during the summer. Concerns over environmental pollution increased during the winter. The ratio between observed and predicted forced expiratory volume (OPFEV) decreased a statistically significant mean of 4.58% in the young and 8.86% in the old participants between the summer and winter assessments. The ratio between forced expiratory flow volume during the first second and forced vital capacity (F1FECV) also decreased during the same period (3.96% versus 5.43%). In young participants, there was an inverse association between changes in objective lung function

(F1FECV) and changes in aggregate respiratory symptoms, as well as in self-rated environmental exposures. In old participants, decreased environmental exposures correlated with decreased respiratory symptoms ($r=.28$; $p<.2$). Improvement in self-rated air quality, correlated significantly with improved lung function (F1FECV, $r=.35$; $p<.01$).

Conclusions

Arab Americans' pulmonary health is adversely affected by environmental factors. There is also a high degree of concerns in the Arab community as to health effects from pollutants. Future studies need to more in detail delineate pollutant sources as well as means to combat adverse health effects.

Acknowledgements

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Dependence among adolescent water pipe smokers in Lebanon: A cohort study

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Over the past decade, waterpipe (WP) smoking has dramatically become a worldwide phenomenon among youth. The evidence-based solutions to the WP epidemic still lag behind. Obviously, interventions are needed to discourage WP initiation among youth, treat dependent WP smokers, and advance policy and product regulations. Unfortunately, this is hindered in part by the lack of knowledge on how nicotine dependence (ND) develops and manifests in WP smokers. Characterizing ND in WP smokers will help guide the timing and composition of cessation treatments, as well as to counter deceptive product labeling, and drive public health policies to limit WP promotion and youth access. Most studies of ND in WP smokers to date are limited by cross sectional designs, instruments that are geared towards the cigarette, or failure to account for important personal and contextual factors. Thus, an approach that is rooted in common theoretical models of ND, and applies WP-sensitive tools within a longitudinal design has the potential of capturing the full spectrum of ND in young WP smokers.

The aim of this longitudinal study is to: 1) Detect the appearance of first symptoms and diagnosis of ND among young WP smokers, 2) Compare the timing and composition of main dependence symptoms among young WP and cigarette smokers, and 3) Determine the factors that influence the development of ND among young WP smokers.

Monitoring the implementation of WHO Framework Convention on Tobacco Control using secondary data in WHO Eastern Mediterranean Region (EMR) countries

Gulnoza Usmanova

Independent researcher (e-mail:u.gulnoza@gmail.com)

Objectives

We used Global Youth Tobacco Survey (GYTS) data to monitor articles of the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) in WHO Eastern Mediterranean Region (EMR) countries.

Methods

The GYTS is a school-based survey, which uses a two-stage sample design to produce representative, independent, cross-sectional estimates. The GYTS was conducted in 23 countries in WHO EMR countries from 1999 to 2008.

Results

The prevalence of ever smoking among youth in EMRO varied between 3.7% and 49.5%. While prevalence of current smoking varied between 0.6% and 18.6%. The prevalence of ever and current cigarette smokers increased substantially over time in two countries. The prevalence of smokeless tobacco use ranged between 0.5% and 33.8%. At the same time the likelihood of initiating smoking in the year following the survey increased over time in one country. Another alarming result of this analysis is that more than 50% of youth initiated smoking before age 10 in three countries. Exposure to second hand smoking at home was as high as 78.4% and as low as 13.5%. In five countries fewer youth supported a ban on smoking in public places. In four countries more youth saw actors smoking on TV. Fewer youth were offered free cigarettes in ten countries; in eight countries youth saw less advertisement on TV; in seven countries youth had fewer items with a tobacco logo, discussed more reasons for smoking and dangers of smoking, and were less exposed to SHS at home; in six countries youth saw less advertisement at sports events.

Conclusion

Extensive efforts to increase awareness about harm from smokeless tobacco use in this region are urgently needed, and further efforts should target media and advertisement of tobacco products.

Progress on Tobacco Control in Oman: successes and challenges

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Ministry of Health of Oman

Prior to the 1970's, smoking was prohibited in all public places in Oman. However, since then the prevalence of smoking has increased dramatically to 15% among males and <2% among females. The prevalence among school children aged 13-15 years has declined, while smokeless tobacco use has increased between 2003 and 2010. Currently, Oman has no national tobacco control legislation, although tobacco advertisements are only banned in TV and Radio (unofficially) and there are restrictions on tobacco promotions. Over the past 15 years there has been an increasing trend to smoke waterpipe in Oman. The authorities have not been successful in banning this type of tobacco use indoor despite its legal action against coffee shops serving this product. Taxes on tobacco have been static since 2000. If Oman implemented MPOWER comprehensively, the current prevalence of tobacco use could be reduced by 40% or more. Examples of the role of tobacco industry in delaying the implementation of the WHO Framework Convention on Tobacco Control (FCTC) in Oman and Gulf States was also discussed.

Bronchial asthma in Qatari school children: Preliminary analysis of data from the National Epidemiological Pilot Study of Lung Health

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Bronchial asthma (BA) is an important health problem, being the commonest chronic respiratory disorder in childhood and adolescents. The prevalence of BA has increased worldwide since the 1960's, but many recent studies suggest that BA prevalence in children has now reached a plateau, and is even declining in some countries. However, most research investigating the prevalence of BA and other allergic diseases has focused on young children, children in early puberty (13-14 years) or adults. A previous study (2003/2004) reported the prevalence of BA in Qatari schoolchildren (6-14 years) to be 19.8% (*Janahi et al., Pediatr Pulmonol, 41:80-86, 2006*) - higher than in most other countries, even within the GCC. Several factors are currently thought to contribute to these increasing figures; vitamin D deficiency, consanguinity, the use of incense indoor, air pollution and obesity.

The objectives of the National Epidemiological Study of Lung Health (NESLH) were to obtain normative values for pulmonary function tests, and study the prevalence of BA and allergies among Qatari school children aged 12 – 18 years.

The sampling frame for NESLH was the entire population of Qatari schoolchildren (grades 7 thru 12) attending government schools during 2008-2009. A sample was obtained by random selection from a list of all Qatari pupils provided by the schools.

The final sample comprised 734 Qatari children (age 11-21 years), with a majority of girls (56.3%). The prevalence of self-declared smokers was 3.6%, (mostly boys), although saliva samples demonstrated measurable levels of cotinine in ~20% of the children. The overall prevalence of diagnosed BA was 18.9%, and more common in boys. Rhinitis was equally common, 19.3%, but in contrast to BA, with a more equal distribution between the genders. Eczema was lower than both BA and rhinitis, with a prevalence of 9.3%. Preterm birth was associated with an increased risk for BA as well as reported BA for the father.

The initial analysis of the results from NESLH demonstrates that in Qatari school children the prevalence of BA and rhinitis was high, and comparable to those in other countries in the region. In comparison to an earlier report, BA demonstrated unaltered prevalence between 2003/2004 and 2009/2010, indicating the reach of a plateau, as shown also for some Western countries. Almost 20% of the students demonstrated elevated saliva cotinine levels, indicating active and/or second hand smoking, that might be a precipitating factor for the development of allergies the in respiratory tract.

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Risks of medicalization in applying the diagnostic conceptualization of PTSD and Trauma in the Middle East: Gaza situation

Abdelhamid Afana
Jesoor Organization for Trauma and Recovery

The conceptual and cultural validity of the PTSD criteria as applied to traumatized people in the Middle East and implications to both clinical and community services is discussed and analyzed in this paper.

Although the diagnostic construct of PTSD describes some features of a universal trauma response, it ignores other culturally specific forms of expressing trauma-related reactions. Cultural meaning, social representation and people's natural reactions and resilience have generated extensive challenge to the transcultural applicability of PTSD clusters as currently described.

Mental health professionals need this information to more accurately assess presentation of people's suffering, to better communicate their understanding and concern, to promote treatment acceptance, and to reduce disease burden. The existing diagnostic conceptualization of PTSD contributes to the medicalization of suffering and diverting attention from understanding and addressing the broader social and psychological determinants causes and consequences of traumatic events such as war and genocide.

Road Safety Research Program in Oman-Achievements & Challenges

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Muscat, Oman

Introduction

Recent affluence in Oman has triggered an increase in motorization rates, which in turn has resulted in an increased burden of road traffic fatalities and injuries. There is an indication that Oman has one of the highest road traffic mortality rate in the world far exceeded the global average of 19 per 100,000 population. Globally, Oman is ranked as 10th the country with most dangerous road with estimated mortality rate of 30.4 per 100,000 population.

Purpose

Due to such trend, Oman has been instrumental in highlighting global burden of road-traffic accidents at UN General Assembly. This has culminated in a resolution to make 2011–2020 the “Decade of Action for Road Safety”.

Methods

Recognizing the importance of research to understand and to provide effective interventions to RTI, the Research Council initiated a strategic program on road safety research on June 2009 for five years, Road Safety Research Program (RSRP). The main objective of the RSRP is to promote scientific research and build national capacity on road safety for the purpose of supporting decision makers to implement evidence-based solutions to combat the Road Traffic Injuries (RTI) in the Sultanate of Oman. RSRP operates on the basis of competitive and commissioned research grants as means to promote innovative research projects that would have a direct bearing on reducing the burden of road traffic injuries (RTI) in Oman.

Summary

We highlight major projects funded within RSRP and challenges associated with implantation of these projects.

Improving Injury Prevention Research in Egypt and the Middle East

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Introduction

Injuries are a significant public health problem worldwide; daily thousands of people are killed, injured, and disabled. Those who are killed often leave behind shattered families and communities, while many of those who are injured will never return to their normal life because of psychological and physical disabilities. As one of the leading causes of death and disability in the world, human trauma disproportionately impacts individuals in developing countries with injuries from motor vehicle collisions a prime example. According to the World Health Organization (WHO), road traffic crashes worldwide disable between 20 and 50 million individuals and kill 1.2 million people per year. The majority of individuals affected are young adults, especially men, who come from low-income and middle-income countries.

Aim

Our program aim is to expand the scientific interest related to injury research and the policy importance of injury prevention and control in Egypt and the Arab Middle East.

Methods

Through our *Injury Prevention Research Training in Egypt and the Middle East program*, supported through funding from the U.S. National Institutes of Health's Fogarty International Center, was collaborated with the Egyptian Ministry of Health and Population (MOHP), Ain Shams University and other Egyptian health professionals to increase their knowledge and understanding of human trauma and injury prevention and research in order to help them apply this knowledge in public health and clinical practice to decrease the significant morbidity and mortality caused by injuries

Results

To date, approximately 850 trainees from countries in the Middle East, including Egypt, Iraq, Sudan, Palestine, Saudi Arabia, Syria, Yemen, Pakistan, Iran, Oman and Afghanistan have participated in one or more of the training courses initiated through this program. The majority of these individuals have been trained in one of our short course offerings, primarily our Sequential Trauma Educational Programs (STEPS) course to improve the clinical care of trauma patients. We also trained 27 individuals in the long-term injury research training component of this program; the majority of these trainees are completing research projects, advanced degrees or have accepted faculty/leadership positions at academic institutions or in governmental agencies in Egypt.

Conclusion

We present here our experience in the process of injury prevention and care training from a high-income (U.S.) to a low-middle income (Egypt) country. We have made significant progress in acute care capacity in Egypt and program sustainability through this program and hope the lessons we have learned can be disseminated and implemented in other regional lower-and middle-income countries.

Understanding and changing the deadly driving behaviors of young Arab men

Susan Dun

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The costs, both monetary and psychological, associated with the injuries and deaths caused by motor vehicle collisions (MVC) have motivated numerous message campaigns designed to encourage drivers to engage in less risky behaviors in many locales. Young men, aged 18-25 years old, are the highest at risk in most countries. Targeted or tailored messages are the most likely to effectively change attitudes and behaviors (Yzer, 2012). We thus focus on an understudied group: young male Arab drivers between the ages of 18-25 with the aim of discovering their driving attitudes and behavioral intentions. We report here the pilot study examining their driving attitudes and beliefs with a particular focus on the method we used to encourage open, frank discussions. By mimicking a common cultural setting, the majlis, we succeeded in eliciting a robust conversation of the participants' driving attitudes and behaviors. The participants are similar in some respects to their counterparts in other countries in sensation seeking and risk taking. However, they also had unique religious and cultural beliefs that are strongly linked to their justifications for their driving behavior that are critical to understand for message campaigns to be successful.

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