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**Use of Mobile Technology and Social Media to Prevent Obesity Among Jordanian Youth,
2014-2015**

By

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Degree to be awarded: Master of Public Health

Hubert Department of Global Health

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An Abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
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Master of Public Health
in Global Health
2015

Abstract

Use of Mobile Technology and Social Media to Prevent Obesity Among Jordanian Youth, 2014-2015

By F. Ameena Nalim

Non-communicable diseases (NCDs) (e.g., diabetes, cardiovascular diseases, cancers) were responsible for 38M (68%) of the 56M global deaths, in 2012. Almost 28M of all NCD-related deaths occurred in low and middle-income countries including the Eastern Mediterranean Region (EMR) and Jordan. In 2005, over 50% of deaths in Jordan were NCD-related. In 2002, the first Jordan Behavioral Risk Factor Survey (JBRFSS) of prevalence of risk factors for chronic disease indicated that physical inactivity and obesity increased the burden of chronic disease. In 2004, prevalence of obesity increased by 52%. In 2007, about 36% of youth, ages 18 years and older, were overweight or obese. We were interested in understanding how participants perceived overweight and obesity among Jordanian youth, how participants perceived the use of mobile technology and social media for raising awareness of overweight and obesity among youth, and exploring some other methods to raise awareness of overweight among Jordanian youth.

In 2014, 16 key-informant and nine in-depth interviews of youth, as well as five focus group discussions were conducted, in Jordan. The nine youth who were interviewed were 18-35 years old. Qualitative analysis of verbatim transcripts was conducted to identify themes and patterns by developing thick descriptions of the important issues around overweight, obesity, and lifestyle behaviors, as well as perspectives on the use of mobile technology and social media as a feasible method of disseminating health information to prevent NCDs.

Physical inactivity and unhealthy diet were perceived as behaviors that influenced overweight, obesity, and good health. A shift from traditional Jordanian diet to a Western diet was taking place with heavy marketing increasing intake of cheaper fast foods delivered free of charge. Social and cultural factors, stress, and poor health education were perceived as barriers. Jordanians own at least one mobile phone. However, there was universal agreement that interventions received via Short-Message Service (SMS) would be deleted unopened. Use of social media, such as FacebookTM, although popular among Jordanians, should be one tool in a larger communication strategy to motivate and move youth to change risky behavior. Involving youth will ensure that health interventions are relevant, effective, and sustainable.

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Dedication

Gone too soon, much-loved Sister Suneetha, (fondly known as Loku Nangi or Menike Akka),
passed away on January 19, 2015, after her courageous battle with cancer.
Sadly missed by her young kids, husband, mother, Anil, all her siblings, her family and
community

“Surely we belong to God and to Him shall we return”
Quran 2:156

*“What the caterpillar perceives is the end;
to the butterfly is just the beginning”*
Buddhist saying

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There would be no interviews without the many willing participants. I thank all those who took time off their busy schedules at EMPHENET, the Jordan Ministry of Health, health clinics, health directorates, universities, and offices as well as the teachers, students, workers, housewives, youth volunteers, moms and dads, grandmas, grandpas, and grandkids, and numerous others who made me feel welcome and at home in Jordan.

Most importantly, I could not have gone back to school without the support of my family. My husband, who never let me quit, even as our life-changing circumstances, his sister's cancer care and her death seven months later, made it all the more difficult to keep going. Our kids have endured much with mom being in school. My gratitude to my parents goes all the way back to my childhood when they gave me a strong foundation to succeed in all of my studies.

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Use of Mobile Technology and Social Media to Prevent Obesity Among Jordanian Youth, 2014-2015

Background and Introduction

Non-communicable Diseases (NCDs) (e.g., diabetes, cardiovascular diseases, cancers and chronic respiratory diseases) are the leading cause of global deaths. According to the World Health Organization (WHO) Global Status Report that tracked progress in prevention and control of NCDs [1], they were responsible for 38M (68%) of the 56M global deaths in 2012. Over 16M of these deaths (40%) were among those who died prematurely and < 70 years. Almost 28M (~75%) of all NCD-related deaths occurred in low-and middle-income countries (LMIC) negatively impacting socio-economic development.

The Eastern Mediterranean Region (EMR), including Jordan, has seen a rising prevalence of NCDs in the past thirty years [2-4]. The EMR, according to the WHO, refers to all Arab countries as well as Iran, Pakistan, and Afghanistan, but excludes Algeria. It is predicted that the EMR and Africa will see the greatest increase in annual deaths from NCDs [5, 6]. An analysis of health in the Arab world for the years 1990-2010 using data from the Global Burden of Diseases, Injuries, and Risk Factors Study 2010 (GBD 2010) showed that heart disease was the leading cause of death in 2010 with overall increases in NCDs since 1990 [7]. Over 2.2 million people in the EMR died from cardiovascular and respiratory diseases, diabetes, and cancers in 2008 [3]. Known risk factors such as unhealthy diet and sedentary lifestyles have been associated with a high prevalence of chronic diseases such as cardiovascular disease, diabetes, and obesity as well as cancer in the EMR countries [8].

In 2011, the United Nations General Assembly issued a Political Declaration on the Prevention and Control of NCDs to be adopted by Member States. It provided a road map to

address the NCD epidemic [5]. In 2012, an NCD action plan based on the Political Declaration was outlined and endorsed during the 59th WHO Regional Committee for the Eastern Mediterranean Region [5]. In 2014, the United Nations General Assembly conducted a follow-up review to assess progress in the implementation of the 2011 Political Declaration and states that implementation of the roadmap was insufficient and inconsistent. (Global Status Report on NCDs, 2014).

The WHO Plan of Action [9], for reducing NCDs promote the use of new technologies for data collection and the development of cost effective surveillance strategies for resource-limited communities. WHO Member States have set nine voluntary global targets to reduce mortality from four major NCDs by 25% by the year 2025 [1]. These nine targets are the reduction of harmful use of alcohol, physical inactivity, salt/sodium intake, tobacco use, hypertension, diabetes, obesity, and the increase in treatment for prevention of heart attacks, reducing the prevalence of insufficient physical activity by 10%. An additional target was for improved use of technologies and essential medicines in the management of NCDs.

According to a recent study of NCDs in the Arab world, behavioral risk factors such as unhealthy diets and physical inactivity are raising levels of obesity in adults and in children [10]. Modeling of obesity-related disease trends for nine Middle Eastern countries including Jordan has showed that the burden of diabetes, cardiovascular disease, and stroke will increase with increased rates of obesity [11]. Jordan is a country with high NCD morbidity and mortality [2, 11-13]. In 2005, >50% of all deaths in Jordan were NCD-related [2].

Prevention and control of diabetes, high cholesterol, hypertension, are public health priorities in Jordan. An estimated three million people will suffer from diabetes, hypertension, or high cholesterol in Jordan by 2050 [2]. Programs to prevent and control obesity, promote

physical activity, and to increase consumption of a healthy diet will reduce hypertension and chronic NCDs. Modifiable risk factors such as overweight and obesity that increase the burden of NCD play a significant role in reducing productivity and increasing poverty [5, 7].

Obesity has more than doubled globally since 1980. In 2014, eleven percent of men and fifteen percent of women 18 years and older were obese [1]. In the United States, data show that approximately 35% of adults and 17% of children were affected in 2011-2012 by the obesity epidemic [14]. The U.S. Centers for Disease Control and Prevention (CDC, Atlanta) Behavioral Risk Factor Surveillance System (BRFSS) [15] collects data on risk factors including cigarette smoking, diet, physical activity, and hypertension, using a standard questionnaire. The information gathered is used in developing health promotion programs. The survey is conducted via land phones and mobile phones using random digit dialing techniques to select phone numbers. Countries like Jordan do a Stepwise BRFSS survey [13].

In 2002, the first Jordan BRFSS of the prevalence of risk factors for chronic disease conducted by the Jordan Ministry of Health (JMoH), CDC and WHO indicated smoking, physical inactivity, and obesity increased the burden of chronic disease [16]. In 2004, the JBRFSS survey was carried out again and the results indicated that the prevalence of obesity had increased by 52% in Jordan since 2002 [17]. Prevalence of obesity in Jordan is over 35 percent [18]. Results from the JBRFSS in 2007, showed about 36% of the participants, aged 18 years and older were overweight or obese [13]. Overweight and obesity rates were higher among females in Jordan [19-21]. Prevalence of obesity among Jordanian women aged 15-49 years was 38.8% [12].

Over 27% of Jordan's population lives below the poverty line [21]. Prevalence of food insecurity among women in Northern Jordan was shown to be 32% using the U.S. Food Security

Survey, while poverty, unemployment, and illiteracy were socioeconomic factors that played a role in it [22]. Another study highlighted the shifting of traditional diet in Jordan to a high fat, high sugar, and refined carbohydrate diet accompanied by a rise in calorie intake [21]. In 2012, the Eastern Mediterranean Public Health Network (EMPHNET) [23], headquartered in Amman, Jordan, and the JMoH hosted a Global Scientific Conference of the Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET) with the theme: Communicable and Non-communicable Diseases: Public Health Challenges and Successes. The urgent need for tackling NCDs to reduce morbidity and mortality was highlighted [24].

Community interventions that are feasible, cost effective, sustainable, and target the reduction of risk factors (e.g., unhealthy diets, physical inactivity, smoking) are needed for the prevention and control of NCDs in low- and middle-income countries such as Jordan [13, 25]. According to the Global Status Report on NCDs, 2014, [1] actions to prevent and control obesity and other chronic diseases need to be specific to the country or region, taking into account the resources available locally as well as the cultural and ethnic differences for the program interventions to be sustainable. A recent survey of female university students in Northern Jordan highlighted the importance of socio-demographic and dietary factors associated with prevalence of obesity [25]. Another study of adolescent schoolchildren in Jordan documented prevalence of overweight and obesity to be twenty-four percent (24%) and eight percent (8%) respectively [26].

In Europe and North America, the use of handheld devices for text messaging and Internet-based communication far exceeds traditional voice calling using the telephone. In Jordan, media and communication includes the use of telephone, mobile phone, radio, television, Internet and newspaper. According to the World Fact Book Jordan, of approximately 9M cellular

phone users in the country (2012), 15% of the population had >1 cell phone [27], representative of the generally high-tech nature of the Middle East region. Jordan is dubbed as the “*Silicon Valley*” of the Middle East. All schools in Jordan have Internet service and computers. *Al Jami’a Street*, in the northern Governorate of Irbid, also a “*university-town*,” made the Guinness World Records as the street with the largest number of Internet cafes in the world.

Using Short Message Service (SMS) text messaging has become the most common and popular mode of communication among mobile phone users worldwide and in the EMR. Text messaging has been used in clinical settings to remind patients about appointments, testing, and health interventions [28-30]. Many pilot studies have been conducted on the use of SMS and social media for a variety of health communications worldwide [31-37]. Adolescents’ perspectives on using text messages to enhance weight loss efforts indicated that positive, encouraging and carefully tailored text messages to suit their age group would be an effective method of health intervention [38]. A study conducted by researchers at Curtin University in Australia to explore the opinions of overweight adolescents and their parents on the post-participation use of SMS after a healthy lifestyle program suggested that there were mixed feelings about the use of text messaging targeting obese adolescents [39]. SMS has not been put into use for the control and prevention of obesity in the Arab world [35, 36, 40]. Although SMS has been studied as a potential health communication tool in Jordan [41, 42], it has not been carried out as a large-scale intervention at the national level. FacebookTM, also the most popular social media among youth worldwide, has not been adopted as a means of communicating health interventions for the prevention and control of obesity.

Thirty-five percent of Jordan’s 7M people are in the 25-54 year age category, making Jordan a country with a large, young population. Since using mobile phones and social media

(e.g., FacebookTM, Twitter, MySpace) is popular among younger people, SMS interventions that are delivered using a mobile electronic device can be an effective tool for delivering health promotion messages to influence behaviors that are risk factors for obesity. Our objectives were to answer the following questions regarding the use of mobile technology and social media: (a) What are perceptions and preferences of Jordanians receiving SMS health interventions, (b) Do Jordanians think SMS health interventions will be effective, (c) Why or why not.

This qualitative research study was conducted to understand Jordanians' perceptions of the issue of overweight and obesity among youth 18-35 years in Jordan and to explore the feasibility of using mobile technology and social media to reach youth with health promotion messages that could influence behavioral risk factors for non-communicable disease.

Research Design and Methods

Research Objectives

1. What are participant's perceptions of the problem of overweight and obesity among Jordanian youth?
2. How do participants perceive use of mobile technology and social media for raising awareness of overweight and obesity among youth in Jordan?
3. What are some other ways we can raise awareness of overweight among Jordanian youth?

Sampling Plan

In-depth interviews of key informants and youth ages 18-35 as well as focus group discussions were carried out in Jordan, during the summer of 2014. Interview guides with standardized open-ended questions that could guide the interview were prepared prior to data collection. However, some spontaneous generation of questions also took place as the interview progressed and necessitated follow up or probing questions for details on topics that emerged. See appendix for sample interview guides.

Data Collection

Qualitative analysis of verbatim transcripts included data from in-depth interviews and focus group discussions with study participants. Study participants who were in the target age

group self-identified as Jordanian citizens. Focus Group Discussions were conducted to obtain a variety of viewpoints from youth about obesity in Jordan and the use of mobile technology and social media for raising awareness of the problem. FGD participants were separated by age (18-35 years, and >35 years) but not by gender to promote more open discussion.

Recruitment of participants was done in multiple ways. Recruitment of key-informants at the Jordan Ministry of Health (JMoH) was done by going to the JMoH each morning, and contacting persons who had previously agreed to being interviewed. The in-country NCD program coordinator at the Eastern Mediterranean Public Health Network (EMPHNET) was familiar with most of the participants, who had been informed of our arrival and had been briefed on the purpose of our study. These key informants represented a diverse range of different branches or programs at the JMoH. Interviews and FGD were carried out until saturation was reached for the issues around obesity.

Data Analysis

About fifty percent of the interviews were digitally recorded with informed consent. Verbatim transcripts of the interviews and FGD were created from the digital recordings. Textual data were analyzed after de-identifying the data and entering it into MaxQDA. Parts of the recordings that were in Arabic were translated and summarized in English.

Coding and data analysis was carried out using qualitative data analysis software, MAXQDA (Version X, VERBI GmbH. <http://www.maxqda.com/> Berlin, Germany). The coding scheme and codebook was developed with definitions for each code that was used. Codes were used for each of the key themes and subtopics that emerged as the data was analyzed. Codes were revised and refined as new themes and topics emerged during the data analysis. The data

was coded with physical activity as an umbrella code having several sub codes. Food and diet was a broad umbrella code that had many sub-codes such as eating the wrong types of food, and eating large portions of food.

Inter-coding of a part of the data and comparison of codes was done to ensure reliability, and to resolve discrepancies in coding. The primary purpose of the qualitative data analysis was to identify themes and patterns that will inform the design of a pilot study. A thematic analysis was conducted by developing thick descriptions of the important issues around overweight, obesity, and lifestyle behaviors, as well as perspectives on the use of mobile technology and social media as a means of health interventions. To compare common themes and patterns across subgroups of interviews, data was coded according to selected group characteristics such as age category, gender of participant, and location, if rural or urban by governorate. The Emory University Institutional Review Board granted exemption of approval for the study.

Results

A total of nine in-depth youth interviews (IDI), 16 key-informant interviews (KII), and five focus group discussions (FGD), were carried out (Table 1). All participants identified themselves as citizens of Jordan. The nine youth who were interviewed were in the age group 18-35 years. The 16 key-informants were 35 years and older. Two of the five FGD had some participants who were older than 35 years. Three FGD had participants who were youth in the age category 18-35 years. Notes and recordings of participant interviews and focus groups were analyzed according to the methods outlined. Themes were identified in transcripts of interviews and of focus group discussions.

Interview	Description	Governorate	Gender	Age
IDI	Teacher, high school	Ajloun	M	<35
IDI	Family Practice, JMoH	Amman	M	>35
IDI	Communicable diseases, JMoH	Amman	M	>35
IDI	Epidemiologist, JMoH	Amman	M	>35
IDI	Community Medicine, JMoH	Amman	M	>35
IDI	Epidemiologist, Public Health, JMoH	Amman	M	>35
IDI	Volunteer, center for youth, NGO	Amman	M	>35
IDI	Community Health Program, JMoH	Amman	M	>35
IDI	Bank employee	Amman	M	<35
IDI	Telecommunications company manager	Amman	M	<35
IDI	Salesperson, Mall	Amman	M	<35
IDI	Salesperson, Mall	Amman	M	<35
IDI	Nutritionist, Health Directorate	Amman	F	>35
IDI	Primary Health Care, JMoH	Amman	F	>35
IDI	Cardiovascular Disease Prevention, JMoH	Amman	F	>35
IDI	Salesperson, sports store	Amman	F	<35
IDI	Youth volunteer, NGO	Amman	F	<35
IDI	Youth volunteer, NGO	Amman	F	<35
IDI	College student	Amman	F	<35
IDI	Salesperson, Mall	Amman	F	<35
IDI	Salesperson, Mall	Amman	F	<35
IDI	University professor	Balqa	F	<35
IDI	High school teacher	Balqa	M	<35
IDI	University professor	Irbid	M	>35
IDI	Community worker, NGO	Jerash	M	>35
FGD	Administrative assistants, JMoH	Amman	MF	>35
FGD	Health scientists, JMoH	Amman	MF	>35
FGD	Management, Health Directorate	Ajloun	MF	>35
FGD	Youth volunteers, Youth Council	Ajloun	MF	<35
FGD	Youth volunteers, community	Amman	MF	<35
OBS	Volunteers, Health Center	Arjan	MF	*
OBS	Volunteers, Health Center	Dibeen	MF	*

Table1. Description of participants in the study: key-informant interviews (>35 years), youth interviews (<35 years), and focus group discussions, Jordan 2014.

IDI=In-depth interview; FGD=Focus group discussion; OBS=observations; M=Male; F=Female; MF=Male and Female; *Mixed ages, both over and under 35

Part I: Perception of overweight among Jordanian youth

Participants reported that they were aware of overweight and obesity facing people of Jordan. Several common themes emerged across the interviews and focus group discussions that helped us to understand participant's perception of life style behaviors that influenced overweight and obesity among Jordanians.

A. Physical Activity

Physical activity was described as formal exercise and fitness programs inside and outside of school time as well as informal activities like walking, running, commuting to work, and playing sports in open spaces around homes. Physical activity was perceived as a behavior that influenced overweight and obesity, and as being necessary for maintaining good health. All people interviewed regardless of age, location, or socioeconomic factors like education or employment, discussed barriers to physical activity commonly faced by the Jordanian population.

Barriers to physical activity were described as lack of time to exercise or to go to the gym after a long work day, lack of playgrounds and swimming pools in schools and communities, and the excessive use of cars and taxis to travel short distances. A male youth volunteer in a focus group discussion said, *“All people now have a car, ok, so they use the car for everything. This is one of the reason they don't walk... they use the car everywhere, wherever they want to go, even short distance between home and shops and this... they take their car.”* There were mixed views about the cost of using the sports and fitness centers that charged membership fees. While some young men and women complained that sports and fitness programs cost too much money, *“I think if the youth played sports or engaged in anything physical activity they would have the perception that eating junk food is wrong and they will quit it by themselves; but I think this*

country lacks availability of such places where people can go and play for fun without having to pay any money; so that's why people would rather just stay at home rather than go pay money to play; and I think people in the urban places and the rural places they play outside, like in the streets, so they grow up to love playing because they don't have any money it would be easier for them to just stick to healthy food rather than go and eat junk food outside because they don't have any money," said one teenage girl from Amman. However, we interviewed a manager at a Fitness Center who said, *"we have people knocking on doors, we try very hard to increase membership. It is the mentality of the people of Jordan. They are not interested in fitness. We go to hotels and take a piece of our exercise equipment and try to advertise the benefits of exercise."* One participant said *"people sleep too much, more than they used to before, and sit around using electronics instead of being physically active"*. Another girl said physical activity was not supported by some parents; *"some families would rather have their son or daughter inside, rather than playing outside in the streets"* she said. Whether or not a child was allowed to play outside depended on her age. *"No it's not different in the way regarding places, it's different whether it's a boy or a girl. If a girl is 12/13 she is no allowed to play outside."* Several girls said that teachers did not encourage physical activity during the designated physical education (PE) class that was assigned only one hour per week.

Both men and women pointed out that obesity was more of a problem for women in Jordan. Several men and women thought that women were less active than men and gained more weight because they exercised less. However, university men and women walked a lot more, didn't own cars, and were physically active, until they left the university and found sedentary jobs. Women and young girls in rural and urban areas did not walk on the streets just for getting some exercise. Males were more active in school, at work, and at home compared with their female

counterparts. Males interviewed said that they used the school playgrounds to play ball while the females said that nobody insisted that they needed to get out and play.

A distinction was made between physical activity and nutrition programs in government schools versus in the private schools. Private schools had playgrounds, mandated boys and girls to play sports, and had interschool sports events. Some government schools had playgrounds but most did not promote physical activity, especially in all-girls schools. A female who had graduated from a private school said, *“Not all of them (have playgrounds in schools); the fancy sports like the private schools they all have--but the public schools, which is the majority, they don't have play grounds in the school. No, actually, we do (have time set aside for PE), but the public schools they don't stick to it. But me, coming from a private school we used to have a PE class twice a week, where if anyone sat during the class, they would like get a detention because it is not allowed. We were forced to play even if we didn't like it. We used to play football, basketball, volleyball, Ping-Pong and badminton.”* Government schools were segregated by sex while private schools were co-ed. *“Yeah. We used to play together, because our schools was mixed but there are other schools that are private or public that are separate. The public schools are all separate, the girls are alone and the guys are alone, but the private schools some of them are mixed and some of them are males alone and females alone,”* said one girl. Most of the male participants said that government schools had playgrounds and that they used them to play sports.

Long work days meant lack of time for going to the gym. Male and female youth of a focus group discussion in Amman explained that having long work hours did not allow for the use of the gym on work days, regardless of the type of job they held. *“When someone wants to (start) work at 8, until 6 and 7 (pm), he or she doesn't have the time to go to the gym and work out...”*

There were contrasting perspectives on overweight and obesity in children. Overweight was not perceived as a problem common to children <18 years by some of the interviewees. As one young lady said, *“the kids who play sports are normal size...I used to be overweight, But I diet and exercise and lose weight 8 kilos”* (female salesperson). Others thought the interventions should target young children. *“I think that if the health messages are sent at a young age, maybe their friends will influence each other to be more healthy rather than be unhealthy. And I think if they grew to know that this is wrong they would have enough knowledge to make decisions to stop eating such things even if they were peer pressured. But sending the health messages at an older age I think it will not make a difference because they assume that they already know that this is bad and even if they did they would not change their bad habit.”* One researcher who had studied obesity in children told us, *“In the last 5 years we started to see more obesity among children, because of the abuse of the technology. So, they take their laptops and tabs and mobiles and they are walking instead of swimming (during a trip to the Dead Sea). Chatting or they, instead of playing, they are on their tablets. Instead of this they are taking their mobiles and...yes, actually, this is a warning sign for increase in childhood obesity, actually. And I have been interested in people, actually, I am looking at the risk factors for obesity, among schoolchildren, watching TV, working on the computer and mobiles was the main determinants of obesity...in schools in Jordan.”*

A limited number of free youth camps are offered in the summer months of June, July and August, including one in Ajloun Youth Camp. Boys and girls can attend these camps. These camps offer sports and other outdoor activities for approximately 25,000 school-age participants nationwide. A focus group discussion participant who was a health worker said, *“At time, the Youth Centers in coordination with the Ministry of Youth and in the summer camps, they have*

summer camps, 1 week 2 weeks and they have sessions, they have shows. Yes, we used to have uhh...activities--awareness activities, with the Higher Council of Youth. We used to go to the summer camp to have different sessions about healthy lifestyles.” It was suggested that we organize health awareness programs at these camps. We travelled to Ajloun to see the campsite that was not yet in session.

For the first time in Jordan, a Health Walk was staged by women, men, and children in a rural village called Arjan, and was in support of increasing people’s physical activity in order to prevent NCDs. We travelled to the hillside village of Arjan (also spelled Orjan), a lush valley rich in vines and fruit trees (almonds, plums, apricots, figs, olives, green grapes, pomegranates). Water was brought to the hillsides via small irrigation channels. Leaders from the nearby Ajloun Health Directorate presided at the event. Sixty to seventy men and women prepared to walk outside in support of preventing NCDs by promoting physical activities and a healthy diet. The men sat at the table facing the audience of 40-50 women, mostly dressed in the traditional Jordanian long dress “*Abaya*” and headscarf. Several women were dressed in white, similar to nurses and other health professionals at the nearby health clinic. Most of the local womenfolk gathered in the meeting room appeared to be overweight. All conversations and speeches were in Arabic. One young lady dressed in bright yellow was responding repeatedly to the topic being discussed by the elderly male speaker who called the meeting to order. Some of the women sounded their support for what she said. (The discussion was about dancing as a form of physical activity and if Islam permitted dancing and the playing of musical instruments. The lady in yellow agreed with the gentleman that dancing to music in the privacy of her own home was not wrong, while another lady disagreed with her). When the animated discussion was over, the women and men donned the neon vests and hats provided by EMPHNET that had a slogan in

Arabic recommending physical activity to prevent NCDs. Then they left the little crowded room to head out to the street and walked a half-mile together and back. That was the first public demonstration in support of walking outdoors for health benefits staged by women and men in the Jordanian population. Most of the women were expecting to be reprimanded by the menfolk in the families for taking to the streets.

When the walk was over, the women returned to the Social Center to continue with their “healthy-kitchen” activity by preparing a traditional healthy lunch including roasted whole wheat (*Freekeh*), grilled-chicken, figs, nuts, vegetables, salad and yoghurt. The yoghurt drink was made of local sheep milk. The ladies ate together in the inner room. The men ate outside. The small dining room had a display of hand-made pottery and hand-embroidered women’s long dresses. After lunch, we went to the Health Clinic, a two-story building opened in 2014, where sat several women and children waiting to see the one doctor who was on call. EMPHNET had set up an exercise room downstairs with yoga mats and weights for weight lifting as well as exercise machines and a large treadmill. Posters with information about NCDs and risky lifestyle behaviors were on the walls. A computer stood on a desk in a corner of the room.

A week after the meeting in Arjan, we travelled to Ajloun, the Northern capital town of the Ajloun Governorate, North West of Amman. Ajloun has lush green hillsides covered with olive plantations. The Ajloun Health Clinic and EMPHNET had put together a NCD awareness program with local doctors and leaders from the Health Directorate giving talks on lifestyle behaviors that promoted overweight and obesity and importance of good nutrition. A female physician gave a talk on health risks of obesity. Another lady in her early thirties stood up and told the audience how she had lost eight kilograms in two months, after weighing almost a hundred kilograms. Hers was a success story of the benefits of physical activity. Another lady, in

her early sixties, told the audience about losing weight after becoming physically active. A nine-year old girl told her story of being overweight. The Program Coordinator from EMPHNET gave a last talk on NCDs and obesity. Questions from the audience were about obesity and the role of hormones in chicken and meat, cancer, and health effects of nuclear plant emissions. After the talks, the men and women wore the neon NCD vests and hats provided by EMPHNET and marched a half-mile down the road in support of preventing NCDs by promoting physical activities like walking. The walk was followed by a healthy-kitchen activity of women preparing and serving healthy traditional food similar to that served in Arjan. Arjan Health Clinic had paved the way for other Health clinics across the country to follow their example and bring change to the sedentary lifestyle of their people.

A third Health Center in Rajeb, a very rural health clinic with one resident doctor attending to the local villagers, organized a bus ride to the Dibeen Forest Reserve to promote physical activity to prevent NCDs. The road to Rajeb, from the city of Jerash in the Jerash governorate, was lined with green olive groves. Rajeb has fresh water springs used for irrigation in their small farms. The people are too poor to own cars and travel long distances for pleasure. Many of the women on the bus had never been to the Nature Reserve or participated in a bus ride to any location outside of their village. The women rode in one bus and the men in another. The women formed a separate group away from the men after getting off the bus at the Forest Reserve. At the Forest Reserve, the women sat under a tree and waited to listen to the talk given by the EMPHNET Project Coordinator for NCDs. Most of the women appeared very overweight or obese. A few of the younger women strolled around the campsite. Boxed lunches were purchased from a traditional restaurant in town. The Arabic-style food was rich in fat and oils with no fresh vegetable or salad and was served in large portions. The women told me they use “*Samneh*,” a

type of fat used in cooking dishes like Mansaf. All of the community were very supportive of our research project and very willing to help. Many did not speak English.

B. Food and Diet

Bad eating habits and eating the wrong types of food were perceived as behaviors that influenced overweight, obesity, nutrition and good health amongst Jordanians. As one female college student stated, *“I think it differs from one person to another, but I know that everyone knows that junk food is bad because they use the oil so much and so many times when they fry everything, but they say, “we don’t care we only live once” so they would rather eat something that they like, rather than eat something healthy that they might not like.”* Foods that had milk, eggs, yoghurt, and rich in calcium and vitamins were considered healthy. Fatty foods high in cholesterol, traditional food prepared at home, food available at the mall, junk food, fast food high in fat, food that had no vegetables, supermarket food high in carbohydrates, were all considered the wrong types of food. However, youth participants at a focus group discussion pointed out that they did not know how to evaluate healthy food. *“ Another thing is what he said we don’t have, we don’t know how to count calories... the nature of the food in Jordan, it’s fat, full of fat and we love it and that’s the problem.”* A 23-year old female engineer volunteering in public health projects for youth said, *“Yes, I think they are overweight because these days the people change the type of food they eat. They eat fast food, full of fat, with no vegetables, less water. They don’t know why water is important. They drink “gases” drinks, not just soda. They don’t spend time on physical activity. Using mobiles all the time, and laptops and TV, instead of physical activity. Also they sleep more than before, sleeping too much makes them overweight.”*

Some schools sold chips and soda to the students. A parent said, *“If you don’t give at home chocolate or some kind of fast food they will buy it at the school, you know you cant stop*

them from that because they see other children; even this Pepsi Cola and some kind of juices.”

Another parent complained, *“especially private school, they have fast food and they have money to pay cause it’s expensive. Sometimes if you tell your son why don’t you buy something... or whatever it is, they will tell you there is no other choices.”* One father said, *“I think as parent I will tell you the fast food. The second is the food that is sold in the schools, you know, this is a problem. Maybe I think these two are the reason for the overweight and obesity problem in youth.”* The Royal Society for Health Awareness (RSHA), overseen by the Royal family in Jordan, funded health awareness campaigns in schools to promote physical activity and healthy foods.

Aggressive marketing by fast-food restaurants, cheaper prices of fast food, and free delivery to home or work places, were cited as reasons for more people buying their food from the many fast food restaurants like Burger King, McDonalds, KFC, Papa Johns, Pop Eyes, Pizza Hut, Subway, and others. *“Actually they don’t need advertisement because they are public, they are already publicized. No not by (mobile) messages but you will see signs on the street; they sent flyers, newspaper, for all houses, go to the house, door to door distribute it.”* A parent complained about her son wanting fast food, *“and the fast food, you cant stop them when they go out with their friends. And so many now places for fast food, advertisement, now it is easier they will get, they will bring it home, so it is another problem... the delivery, at the beginning when they started the fast food there was no delivery. You will tell your son-- I don’t want to go now. Now, anytime, even after twelve o clock, any time they will call; the delivery...make it easier.”*

“All fast food restaurants deliver to your home to make it easier for you to eat fast food” summed up one participant. Food insecurity and the affordability of healthy food were discussed. Grilled meat in more traditional food was more expensive than meat in fast food restaurants.

Parents played a role in whether the youth ate healthy food. Reasons given were that parents ate fast food and did not cook healthy food at home; parents worked and did not have time to cook at home. According to a female college student, *“Well, if the parents grew up to eat junk food rather than the food at home they would carry this thing on to their children because their children look up to their parents and if they see that their parents don’t cook or they would rather eat outside rather than eat something healthy at home, they would catch this bad habit from them and they will end up like them. but if the parents have strict rule of no junk food or you can eat junk food once a week or a month, the children will grow to have these er good habits that would make them not eat junk food and go for the healthy food, instead.”* One young participant said, *“I think that the children they eat much more fatty food or junk food more than their parents because their parents usually work and when they finish work they are usually at home, so they will eat healthy food at home but the children they are always out, and there is no option to eat healthy food outside so it is always junk food, wherever they go it is junk food.”* Many men and women said that “gases” (soda) was being drunk more frequently and preferred over water. *“Diets are only for a short time,”* said one girl who tried to diet by not eating for about a week and then started eating too much. Nutrition programs like Weight Watchers cost money. *“There are nutrition centers, they are new. The nutrition program called “Lively” costs money about 400 JD/month. My cousin was fat and she was advised by the nutrition program and lost weight.”*

Many participants said that it was the mother who cooked at home and if she did not cook healthy food, then everybody ate unhealthy food. *“Parents do not pay attention to food. They don’t know about making healthy food,”* said another female participant. A female sports store manager thought that children 7-10 years old were already overweight. She said, *“especially in*

children age 7-10yrs. The kids go upstairs to buy stuff from the kid's section and then they come back downstairs to use men's size. They don't find clothing that fit them in the section for kids. They come in eating junk food, absolutely. The parents are also big. Of course they are eating junk food. The family affects them. The boys in this age group are more fat than girls are."

Eating out with friends was given as a reason for gaining weight. Both men and women said that they eat at fast food restaurants when they eat out with friends. It was a new norm among youth. *"There are a variety of restaurants, there is restaurants that need a lot of money and there are restaurants that many can afford to eat at. "That's the bad thing about our country is that everything is available" to all kinds of people."* *"All fast food restaurants deliver to your home to make it easier for you to eat junk food."* One participant said, *"I have my mum to cook at home so why should I pay money to eat the same thing (outside). Only women said serving sizes of fast food were too big for one person.*

C. Social and Cultural Influences

According to some participants, there was stigma associated with having diabetes or hypertension. It was less likely that a female would admit to having a chronic disease. *"Kind of a stigma, because they refused, especially the female, they refused to declare they have diabetes or hypertension,"* said one key-informant. Cultural barriers to eating healthy were mentioned by both men and women in both urban and rural areas. *"Jordanians love to serve you traditional fatty food even if they know it is bad for you (Mansaf, a traditional fried rice with nuts, and meat, was mentioned a couple of times) which is high in fat, so that they give you the best, some families will ask you if you want Mansaf, and give you healthy food instead."*

Eating out when at work and not packing a lunch from home was considered the norm. One mother said, *"When they get older they don't like to take sandwich from home. They think*

this issue is for the small ehh-students, so they used to buy from the school. I have it for... from personally I mean. And this experience they don't like to take sandwich from home. They will buy from the school. Peer pressure.

Men and women stopped worrying about their shape or figure as they grew older. A young married salesman said, *“The community makes comments about my putting on weight. About my belly (pointing to it); at my age, people are conscious of the weight they gain. As they get older, they lose interest in maintaining their figure. Females gain more weight than men because they are less active. Men work more. Girls exercise less. For my kids, I avoid bringing certain foods home.”* Women complained that the husbands stopped encouraging them to maintain their figure after they were married. A very skinny, unmarried, youth volunteer from Amman who was also an engineer said, *“Arab women culture we think of Arab women as being busy inside the house, and cooking and cleaning and keeping the family happy. Also the men, after marriage for 20 years, when they are older they don't take care for their women in Jordan. They need to continue to appreciate the women. Tell her she is getting fat. That she looks nice in this not that and so on. To appreciate her then she will take care more care (of her appearance). The woman has no time to take care of herself. The men go to work and the women stay at home. I think the women should work outside the home--both inside and outside. Also, the physiology of Arabic people—eat more if not happy. When I get angry I eat more. Family is not happy and more stress makes you eat more.”*

People in rural villages had open spaces to be used as play areas but did not have family support to *“play in the streets”* after puberty. One city-raised female teenager said, *“Yes, this is what I said, in rural areas the families are more narrow minded they are close minded and are not open and they haven't engaged in a situation where they face someone who is open, to see*

that they are wrong and they need to get better. So these places have some basic principles, and they stick to it even though the generations are coming more open and the city is changing and everything is changing around them, but they still think backwards, they are more classical.”

When asked about the lifestyle of youth in rural Jordan, she said, *“They do know that Amman is different, but they don’t have a choice they are forced to live like that; and people here in Jordan, they are afraid of their mum and dad, and they don’t have the choice to say no to them even though they know its right. And even if the parents knew that what they said is right they wont say, “ I am sorry I didn’t tell you to do so”. They are forced to do something even though they don’t like to do it, they don’t have a choice they are obliged to do it.* A female worker in Amman said, *“Also Jordanians want to keep everything private. They are not worried about the problem they are worried about keeping the problem private. They don’t try to find a solution to the problem. They want to keep it private.”* One key-informant from Northern Jordan who was married with children explained, *“Let me tell you what is the story. For example, I like to walk with my wife on the street. But people they look at this as a bad thing. It is cultural issues. I like to walk on the university street but I don’t like all people looking at my wife, you know, and you will hear many words, many bad words, that’s why. It is harassment, like verbal harassment. Nobody wants to hear this about his wife or sister or like this. So that’s why. They are more comfortable at home. Usually for the covered woman, they cannot walk. They have to wear something like sports clothes, but they cannot wear because they are conservative. In some cultures, in some villages, for example, if you see someone is walking, for example, a woman, everybody is laughing at her, “You look at her she is practicing, she is exercising: she is a crazy woman,” look at her.”*

D. Stress

Unmarried men and unmarried women mentioned being stressed and eating to alleviate stress and anger. Perceived stress was the reason why they ate too much said two females who were college graduates and unmarried. Personal troubles such as breaking up with ones fiancé also made some participants overeat. *“I think the stress makes them eat too much. Trouble makes them eat. My friend was a model, she broke up with her fiancé and started eating too much and got really fat; mental issues.”* Stress and depression were cited as reasons for not being physically active. A 25-year old female graduate said, *“All youth in Jordan are depressed. Reasons? Money, employment, family relations; people in Jordan are never satisfied. If they are married they want to become single. If they are single they want to get married. They are never satisfied. Divorce is high. Even suicide is high in Jordan. One boy committed suicide because his mother talked to him strongly. But I don’t think she talked to him strongly, I think depression is the reason.”* The average age of marriage has increased due to financial burdens, work, and higher education. However, youth in the target age group may be married and become parents as well.

E. Genetic Disposition

Inherited genetic pre-disposition for gaining weight was stated as a reason for being overweight or obese. *“If parents are overweight, then the sons and daughters will be overweight,”* said a male teacher. A female salesperson in Amman said, *“maybe its genetics or you take this things from you parents. If they are overweight you will get the same kind of genes and be overweight as well. And its not just eating food outside.”* However, other participants thought that the effect of inherited genes for overweight were insignificant compared with bad eating habits. One 25 year old female interviewed said, *“Hormones, maybe, I don’t know. Bad*

eating habits, the effect of genetics is small. And diets are only for a short time. I tried to diet by not eating—I starved for about a week and then I could not carry it on so I started eating and ate too much.”

F. Health Education

Some of the participants said that teachers did not teach health class in school. *“Yes. I study in government school so its (playground) always closed and...I didn’t remember that we have a teacher for this.”* The schools did not insist on students’ physical education class time being spent outside. *“We had physical activity class one hour for the whole week, and the teacher did nothing. We did nothing.”* The school curriculum did not include sufficient time for physical education and health education. *“Yeah, And here the health messages could be sent through the teachers, people can come from outside and give like lectures about the effects of junk food, which makes them gross out from junk food, rather than like it, the problem already exists at an older age.”* Teachers were not aware of NCDs and the health benefits of physical activity and good nutrition. They did not screen for overweight or obese students. Some youth believed that people were not aware of nutritive value of foods. *“Jordanian people maybe we don’t know like this like this piece its healthy and like fat and carbohydrate how much, how much carbohydrate how much sugar.”*

Part II: Use of mobile technology and social media for raising awareness of overweight and obesity among Jordanian youth

All of the participants indicated that they own and use at least one mobile phone, and that a large proportion of Jordanians own multiple mobile phones including smart phones for their personal use. *“The majority of Jordanians have one phone. They have two phones if they have one smartphone. But they mostly use the smartphone. I use a smartphone from the day it came*

out, more than five years now” (male salesperson). A father of three who worked for the government said, “Most of them, they have three lines. I have in my family three daughters, each of them have three lines: Zain, Orange and Omni. Even in the rural areas, the desert area, there is a mobile. There is one photo on Facebook of a shepherd, he is taking care of sheep and in the desert he is using a mobile.”

Participants said they use Email, WhatsApp, Skype, Facebook™, and other Apps on their smart phone or Tablet. Children, who were as young as eight years old, have Facebook™ accounts. Short-Message Service (SMS) text messaging was very popular amongst all people in Jordan. As one female participant said, *“The most effective way to reach the young people is through mobile”*. However, there was unanimous agreement amongst the participants that lifestyle change interventions received via mobile phone text messages would be deleted unopened. Use of text messages to increase awareness of overweight and obesity was not encouraged by the youth. The most common answer to whether health messages should be sent using SMS text messages was, *“I will not open it. I will delete it before I read. Texting will be boring”*. Text messages that asked people to subscribe to a service that sends health messages upon request and payment of a fee were considered a nuisance and to be avoided. *“Rather than text messages, send an App with messages everyday. They have to do it everyday. Text will be deleted especially if it is from a stranger. But do an App, with no advertisements. I have downloaded an App for the website that I told you about, but they have advertisements.”*

Some focus group participants had tried to use SMS text messages for health promotion through the government without success. *“Yes, we try to use the SMS many times but because of the cost. It’s very costly. The funds. Yes. Because of the messages we (at the Ministry of _) have to coordinate with the Ministry of Technology; and also if each message you (the recipients)*

have to pay or other person will use the mobile will have to pay he will not. He will not participate in the messages because we have many advertisements through the mobile for the Healthy foods, and for the many things; But if it costs...nobody (will not participate). We have experience before with; it was difficult to implement. One time we implemented (a program) last year.” One key informant from Zain, one of the largest telecommunications companies in Jordan, gave an estimate of 0.045 Jordanian Dinar per SMS for sending 5000-25000 SMS messages to Zain customers in a specified location with a message that would not exceed 160 English characters. It would not be free. A key-informant from the Ministry of Health told us that Zain Telecommunications had sent one health message to all their subscribers on World Hypertension Day. *“It was a reminder to measure that today we have the World Hypertension, Day. For those who are 25 years and above, please measure your blood pressure. Umm, visit the nearest health center and measure your blood pressure because high blood pressure is a dangerous issue.”*

Coordination of efforts between the ministries for health, communication, and technology was a challenge that was a barrier to implementing a SMS text message health promotion program in Jordan. The Ministry of Technology was able to subsidize the SMS text messages for the Ministry of Health to carry out a health awareness campaign, however, due to the challenges faced in coordinating such an interdisciplinary program, alternative communication strategies like workshops and seminars were carried out instead. *“Yeah the problem was that the Ministry of Technology, last year, they gave us a very good price if we want to use it for free. Not free, but very, yeah, minimal price if you can use for messages, awareness. But the problem was coordination... you have to coordinate with many people at the Ministry of Health, you know, and the Minister of ah of Communication. Ahh! at the end I said no; it was the easier way of it*

you know. Sessions or uh counseling sessions eh Workshops something like seminars, face-to-face communication. Also its not just ehh..mobile,, maybe social media like ehh...Facebook maybe.” Another method that was tried was to maintain a website, “*Sahetna=our health*” that was started by a U.S institution of higher education but the Ministry of Health in Jordan ran out of funds to be able to maintain the site for more than six months. Health messaging covering all aspects of health was carried out via radio, TV, and newspaper, for free, if and when the space was made available, as the ministry was no longer able to fund mass media campaigns, in 2014.

In an interview of a manager at a Fitness center in Amman, he was asked if he thought that SMS text messages would be effective in raising awareness of overweight and obesity. He said: *“In my opinion, I think the answer is no. It will be a waste of money. For example, we had a promotion and we sent about 6000 SMS and got a response of about 10 call-ins. Our membership department sent the messages to non-members who are subscribers of cell phones.”* We asked him what was a successful membership drive. He said, *“We call up people and ask them if they will join. We tell them the benefits of membership and persuade them to try it. We ask them to come and try it. It is the personal interaction that is successful. Each caller calls a 100 people a day. Asked about receiving text messages, he said, “I get text messages, and I don’t even open it. I just delete it. Maybe your ideas will work outside of Amman because kids in rural areas will be excited to receive text--any text messages. You can pilot it elsewhere.”*

Youth who were interviewed indicated that they check Facebook™ using mobile technology. Facebook™ would be a more economical and effective method of receiving health promotion messages that target youth. One participant pointed out that Facebook™ would educate the young but not the older people who have chronic diseases. *“Problem is that there is a huge gap between young and old, youth use Facebook and old don’t. You have to find a*

method to reach both the young and the old. There is a gap between the young and the middle and the older people. The young changes the older about health or politics or whatever. They give directions to the old about health.”

Part III: Other ways to raise awareness of overweight among Jordanian youth

Other channels of communication and message design to heighten message effectiveness and to motivate and move youth to change behavior were suggested. People suggested we use popular TV programs, radio programs, workshops, visuals, information sessions, and organize wellness days, as well as health and fitness programs in the schools. A key-informant working for a local public health, non-governmental organization said, *“Lets say we can make a wellness day er a national wellness day. Sharing all different sectors of community. We can call all these er ... maybe all associations, medical services, er, even so, and government, addition to the private sector, make a wellness day and lets say er make a special logo for this day and announce before one month for this campaign and will be a national day in any governorate.”*

FacebookTM messages that had pictures and video were considered better than plain text messages. Several youth had similar sentiments. *“I think videos or pictures, they grab your attention more than texts because texts you can ignore them but when you are watching a video or looking at a picture, you will unintentionally continue reading to know what it talks about it.”*

Participants were asked what type of messages would be most effective in bringing about awareness and action. Various types of messages were suggested. Messages must be targeted to overweight and obese individuals, must be engaging, humorous, relevant, and suggest some action that could be taken to result in weight loss. *“I think what is effective is to send the health messages that will give them the chance to change their lifestyle. So in order to say, stop eating junk food, you can give them an advertisement that would show them places that sell healthy*

food that they don't know of, for instance the only fast food restaurant that is healthy that I know of is Subway and the only way I knew that Subway opened in Jordan is through TV or on the radio, some of the ways that would grab their attention is giving them an alternative to what they could eat rather than tell them that this is wrong, because they already know it; because it will make them shut down and not listen to what it says.” “Stand-up comedy is popular.... Humor is suggested. Video by funny way is the best way. Maybe if test message begins with a joke and ends with a fact.” A holistic approach to health promotion was recommended.

Messages should feature popular characters and motivational figures, show real people before and after weight loss, and show consequences of not losing weight as examples. *“In person will be better. Bring some people in a room, and talk to them. Popular people like Prince Hamza; he is in this age, is interested in basketball and involves youth. Also Prince Ali his brother is into football. I think Prince Ali is older. I am not sure. Football players can also be used. Use their pictures, of fat and thin players. Youth watch them.”*

Several participants suggested that we focus our programs on a younger age group. Youth interviewed recommended that we target school-age teenagers in the 10-18 year old category. It was suggested that, *“the health messages could be sent through the teachers. People can come from outside and give like lectures about the effects of junk food, which makes them gross out from junk food, rather than like it, the problem already exists at an older age.”* Another female college graduate working in Amman said, *“problem of overweight and obesity especially in the below 18 age group. School age kids eat fast food. There is too much obesity in this age group. And parents do not pay attention to food. They don't know about making healthy food. We don't workout, don't run on the streets, physical activity is low, no culture of working out, use the taxi too much.”*

Local Jordanian TV was not popular. Several participants said that Jordanian TV was not popular because they aired old movies and outdated programs not interesting to the youth of Jordan. Channels being broadcast from outside Jordan were received more favorably because they had new movies and programs relevant to youth. One TV channel in particular, the *Royya* Channel, was very popular among young adults. Many participants, especially women, in the 25-36 years age category had watched programs like *The Seven Doctors*, which focused on health issues. One younger participant preferred TV messages rather than receiving Facebook™ messages, *“I think the best health message to be sent is through the TV; it’s not on social media and it’s not on the mobile; because If I got a message on my phone I will just delete it if I saw that contact is not someone I know; and same thing on Facebook. I would just scroll down to just not to see it. But on TV, when I am watching something and I am really attached to it and I pay attention to what it says and this is why I noticed that to prevent diabetes you have to walk more to burn more sugar and that way you will not have sugar in your blood; and this advertisement I saw on TV; but if I saw that anywhere else, I would not pay attention to it.”*

Radio messages, especially during the morning show, were suggested *“because everyone will hear it because students going to school will hear it, people going to work they will hear it as well, he can deliver the message to all kinds of people at the same time, targeting all ages.”* The duration of the program was important to the participants who suggested using TV, workshops, and other media. They did not want a one-time message. Many suggested that the health messages be simple, actionable, and repetitive--have follow up reminder messages with accountability. One female sales person said, *“Keep track on what’s happening for a long time.”*

Several youth were in favor of using popular TV personalities to convey health messages. Using good role models were preferred over using only SMS text messages or social media.

Testimonials from people, preferably known public figures, who had lost weight by changing lifestyle behaviors was considered an effective strategy. Messages with information about healthy food, increasing fruits and vegetables intake per day, and cancer incidence information was considered appropriate. Overall, the importance of targeting the right group with the right message for success in changing behaviors was emphasized.

Key informants who had experience working with youth in Ajloun, Amman, and Jerash on harm reduction for injection drug users, marginalized groups of women and orphans, blood borne diseases in HIV and MSM populations, wanted to see a broader strategy to reach youth than SMS text messaging or social media alone. Health interventions that involved direct contact with youth was recommended. A university professor in the Northern governorate of Irbid told us about university students going out into the communities and carrying out public health projects as part of their studies. *“Each summer we recruit er students from faculty of medicine and faculty of nursing. So they visit the surrounding areas and, you know, increase the motivation or talk with people, talk with woman, about these issues, yeah. It is part of a credit program. It is 9 credit hours for the faculty of medicine. Actually, I told you it is not a well-developed program, but it is a successful piece of work, that usually ends with a report compiled by the students, you know.”*

Participants preferred to have training sessions for youth run by youth who have been trained to teach self-empowerment skills to the people in target communities. A health worker told us, *“I think peer education will be more successful because you know youth they will learn more or hear more from their peers, you know others, or the others tell them something they will not be convinced. Even if they want to do something they will be shy from their friends, you know. If they don’t want to smoke, if they don’t want to buy fast food... you know, they will be*

shy if his friend tell him-- you know, why don't you eat like us-- or why you don't smoke? So, I think that peer education will have more, will be more successful, I think." One social worker told us that we could even raise awareness among youth in Jordan by talking to them in the coffee shops, *"in the big city like Amman and Irbid, I think, all of our, er- most of them go to the coffee shops er...and if you remember, our national AIDs program, er, some of our activities, er, we reached the youth, to youth in the coffee shops, and, er, implement some activities in the coffee shops."*

Focus group discussions with health workers gave us details of the outreach method used by health directorates to reach people in communities. The Ministry of Health has 12 Health Promotion Divisions or Directorates with Health Promotion Supervisors overseeing the activities of one or more Health Promoters. For example, the Nutritionist at the Amman Health Directorate is also a Health Promotion Supervisor who is working with orphaned youth. Each Health Directorate has a Health Clinic that has a Health Promotion Coordinator. Health committees are formed in each Health Directorate Jurisdiction that is made up of leaders from each community. *"Health committee or all committee; and the health directorate in the governorate, they have health committee now, every governorate and every health center I think they have er health committee"* (male social worker). The members of the health committees could be local teachers, doctors, nurses, religious leaders and others who work towards promoting health and nutrition for a healthy lifestyle. Several health directorates have carried out health awareness programs in schools to educate school children about healthy lifestyles and behaviors.

The government of Jordan had several of its ministries collaborating to run a program called e-Government in which health messages and other civic information was able via mobile technology. A university professor explained, *"But we have the e-Government. By the e-*

Government, we have received messages from time to time, health education messages yeah. They tell you something—something about the facts. Physical activity, about, you know, er smoking; maybe or road traffic accidents; something like this. They had such an activity but now since two, three years, I don't remember that I received one message. e-Government I think is an excellent project, among all the ministers in Jordan. Ok. They tried to do the communication between all the government, all the ministers, it is very easy to keep following the each other and contact each other easily by this technology. It is usually by mobile. For example, you can check your taxes by sending a message. You can check how many tickets you have by message. But it is Government project but not all Ministries are active joining in (the Ministry of Health did not join).” He also advised us that we should plan on working with the Ministry of Health if we wanted our in-country programs to be successful. “Sometimes, it is common protocol, you have cover by the Ministry of Health. You need umbrella, to cover you officially. Sometimes if you need anything, is not easy, let's say there are many projects coming to the Ministry of Health, I think it not continue because of the opposition inside the Ministry, the Government, the laws, the regulations. Because of this the donors sometimes do not come back, really! The funds don't come back, the donor don't come back again.”

Several people are taking steps towards a healthier lifestyle by modifying risky behaviors. This is a demonstration that there is potential for change. One female college student from Amman said, *“Actually no, we don't (chat with their mobile phones). When I am with my friends we just talk. We don't use the phone. We are different. We don't use the phone when we are together. We promised each other that when my friends and I, when we are out, we don't use the phone unless it's something urgent. Because if we use the phone, its like everyone is sitting alone and his head is in the phone and we are not talking to each other. So we just made like a*

pact that no one will use their phone unless its something urgent and that way we have the chance to talk to each other. Because every time we sit with our families we look around and we see that everyone is sitting on their phone rather than talking to each other. And we saw some advertisement on YouTube that people are changing because they are spending all their time on their phone. So, instead of actually asking someone for direction you can just open Google maps and look where to go and this made communication more hard on people, it makes them more shy and less confident. Yes they use the easy way and just look up on their phone, loose the touch of talking to people.” One young salesman at a watch store in the mall told us he had an annual health checkup for cholesterol and was changing their food habits. “I am married. My wife cooks. Most of the time I pack my lunch from home. We do a plan for the week, and I ask my wife to make meat one day, chicken one day, fish one day, and only vegetables one day. I signed up for websites that send me messages. When you came in I was checking this website about the benefits of eating cilantro. Like “Tabeebi” ((Doctor)) they send messages. I can ask questions and they give me answers. I checked their answers and found them to be reliable. They give names of herbs and other stuff.”

Discussion

Previous research has identified sedentary lifestyles and unhealthy diet as risk factors for chronic disease in the EMR, where the greatest increase in annual deaths from NCDs has been predicted [5, 6, 8]. We analyzed data from interviews carried out in Jordan. To our knowledge, there have not been any qualitative studies exploring youth perspectives of overweight and obesity in Jordan. Overweight and obesity were acknowledged as a problem in Jordan and as risk factors for the increasing burden of NCDs in the region. Most youth are aware of the health risks of being overweight and discussed diabetes, hypertension, cardiovascular disease, and high cholesterol as increasing among people in Jordan. It is estimated that 3M people will suffer from these diseases in Jordan by 2050 [2]. Women are aware that more women are obese than men in their communities. Several studies in the region have shown that more females than males are obese. In 2014, 11% of men and 15% of women 18 years and older were obese [1]. In Jordan, prevalence of obesity among women 15-49 years old was 38% [12]. Physical inactivity, unhealthy food and diet, social and cultural influences, perceived stress, genetic disposition, and insufficient health education were perceived as reasons for overweight and obesity among youth in Jordan (summarized in Table 2).

WHO member states have targeted the reduction of the prevalence of physical inactivity by 10% in their plan of action [1, 9]. In Jordan, physical activity was described as including sports and fitness programs, walking, running, bicycling and playing in playgrounds, commuting to work, and physical education in schools. Physical inactivity was perceived as a behavior that influenced overweight and obesity among youth in Jordan. Male and female youth were frustrated about the barriers to physical activity and wanted change. More male youth than females had enrolled in fitness programs at some time after graduating from school and given it

up due to long work hours and high cost of the programs, even though obesity was seen more as a problem in women than in men. Free facilities at Sports City were not used very much by either girls or boys due to lack of time. Girls in rural areas preferred to stay indoors and play electronic games and use social media on their mobile phones than to walk outside due to lack of approval from parents, family, and community. More females than males were concerned about maintaining their body shape until their marriage. Neither parents nor adolescents made any reference to personal safety as a reason for not playing or walking outdoors in their neighborhoods. More women in rural areas appeared to be overweight than women observed in Amman. Interestingly, it was the women in rural areas who were actively staging health walks, promoting healthy kitchens and bringing about positive change to their current lifestyles and socio-cultural norms. These mothers of children less 18 years old will influence their children's physical exercise and diet. They will be more aware of the physical activity and nutrition programs in their children's schools. Although obesity was not seen by all participants as a problem of young children in Jordan, studies have shown that adolescent schoolchildren in Jordan were becoming overweight and obese [26]. Several key informants suggested carrying out programs in schools and in universities to reach youth of all ages with health messages.

Unhealthy food and diet were given as reasons for overweight and obesity among youth in Jordan. Youth were aware of the shifting of traditional diet in Jordan to a diet high in fat, sugar, carbohydrates and high in calories. This shift has been highlighted in a previous study of the nutrition transition in Jordan [21]. Fast food was cheaper and more accessible (due to free delivery) than traditional and healthy food. Working girls mentioned lack of time to prepare healthy food. More females than males mentioned eating out with friends. Many parents complained about their young children's preference for soda and fast foods and lack of good

nutrition in school food. If health education in school curriculums focused more on good nutrition and physical activity then the youth in Jordan will be able to modify their lifestyles at an earlier age.

The effects of stress levels on obesity in Jordanian youth have not been discussed in previous studies, to the best of our knowledge. Perceived mental stress made the participants over-eat and influenced overweight and obesity. There were several sources of mental stress. Family influenced stress levels. Saving up for marriage was a stress mentioned by males more than by females. The average age of marriage has increased due to financial burdens, work, and higher education. However, youth in the target age group may be married and become parents as well. Some youth in the target age category may be unemployed after graduation, while others may have joined the military. Unofficial unemployment figures estimated for Jordan are as high as 30% by the World Bank with an estimated 12.6% of the labor force 15-24 years unemployed in 2014 [27] (page last updated 07/20/2015).

While all Jordanians had at least one cell phone, 15% of the population had more than one mobile phone [27]. Jordan has a large young population. Jordanian youth in the target age group of 18-35 years make up most of the mobile technology and social media audiences. Health intervention programs in Jordan that tried SMS text messaging to reach the youth, for example in vaccination and HIV prevention programs, had limited success. Mobile technology and social media have not been used directly for the prevention of obesity in Jordan. The cost of using bulk SMS text messaging to send health messages was too high to be sustainable as a health intervention in Jordan. The telecommunication companies would not release user information to facilitate targeting young subscribers or agree to fund bulk text messaging. Young interview participants indicated that text messages would be deleted unread. Social media is free and more

popular. All participants were Facebook™ users regardless of age, gender or location. It is one tool that can be used in the overall communication strategy. YouTube videos, TV programs in the Royya channel, radio messages as well as classroom visits and community workshops and programs to educate youth about the rise in NCD mortality and chronic diseases and increasing prevalence in obesity, should be a priority.

Recommendations

Behavioral interventions that promote healthy lifestyle and nutrition can be delivered through Facebook™, YouTube, blogs, TV, other mass media and workshops, including a national NCD Awareness Day as a larger communication strategy with messages that motivate youth to attain and maintain ideal body weight. Interventions to encourage, remind, and set goals to increase physical activity levels among youth, as well as to eat a healthy diet can be delivered in interactive and engaging social media messages. Greater use of free Sports City facilities should be encouraged with incentives provided. The physical activity centers being set up by EMPHNET in rural health clinics as part of the NCD prevention campaign should be supported and strengthened and more centers set up in other rural health clinics. Weight reducing activities and healthy kitchen programs, like those organized in Arjan and Ajloun Health Directorates, should be emulated by other health directorates in Jordan.

Teachers in schools can be trained to teach physical education and nutrition classes. Private and public school curriculums should increase the one hour per week of physical activity to daily physical activities in both girls and boys schools. School nutrition should be mandated with junk food left out of the school food choices. Youth in universities can be provided opportunities to train as nutritionists and public health practitioners and lead programs on nutrition and health in

their local communities. This will provide youth with more employment opportunities after college and reduce stresses due to unemployment and financial burdens. Public health degree programs in the universities should be strengthened with students having to complete community-based practicums and thesis projects.

Nutritionists and health professionals in the public and private sectors should come together to participate in NCD prevention workshops and meetings to share their knowledge and experiences, as they have been doing. Programs delivered via mass media and social media that encourage children and youth to eat more home-cooked meals high in nutrition and decrease consumption of fried and energy dense foods at fast food restaurants, especially when eating out with friends, will reduce calorie intake while keeping the Arab food culture. These health messages should counter the aggressive marketing being done by fast-food businesses. Famous people that youth have taken as role models can influence behavioral change by delivering health messages to youth. Policy makers should focus more on making it easier and more convenient to purchase fresh foods in areas where the supply is insufficient and expensive. Health counseling services focused on NCD prevention and control can be provided to couples at the time that they get their mandatory Thalassemia tests done prior to getting married with follow-up counseling after marriage.

Health committees made up of leaders from each community, local teachers, doctors, nurses, religious leaders and others who work towards promoting health and nutrition have carried out health awareness programs in schools to educate school children about healthy lifestyles and behaviors. This grassroots level health promotion should be continued and strengthened with volunteers being recognized and rewarded for their great efforts.

Limitations

The research presented in this thesis has potential limitations. The interviews were conducted in English with participants speaking in Arabic with the translator when they felt more comfortable doing so. The translator responded in Arabic and may have sometimes influenced their responses. The translator was not trained in qualitative research methodology. The interviewer did not understand Arabic. Participant responses may be what they thought was a socially acceptable answer rather than a truthful response. This is a limitation of all qualitative studies. The age group 18-35 years may be too wide as it includes college students, recent graduates and those in the work force. Each of these sub-groups has its own motivations for lifestyle behaviors that may influence their perspectives of the issue of obesity.

Table 2: Perception of Risk Factors and Barriers to Prevention and Control of Overweight and Obesity Among Jordanian Youth

Overweight and Obesity						
Risk Factors	Physical Inactivity	Food & Diet	Social & Cultural Influences	Stress	Genetic Disposition	Health Education
	Fitness programs, sports, walking, running, commuting to work, playing in playgrounds	Types of food Soda Fast food Quantity Nutrition	Physical activities Food habits	Overeating Over sleeping Inactive	Inherent capacity to become overweight and obese	Nutrition information Physical activity classes
Barriers	Time Money Space Electronic games, Culture Location	Time Money Access Availability Knowledge Norms Peer Pressure	Gender Family Traditions Family diet Urban/rural Marriage	Time Money Parents Marriage Social-structure	Parents' weight Hormones	School Curriculum Teachers Parents

Strengths and future directions

The diversity of participants brought different perspectives; for example inclusion of both genders and urban and rural locations. The key informants were also chosen to represent different segments of society, for example, policy makers, teachers, parents, youth, nutritionist, sport and fitness managers, telecommunications representatives, and others, who were

knowledgeable on the topic. For the most part, participant stayed focused on the research topic and the interviewer had many chances to probe deeper especially in the later interviews, which was a result of gaining experience in interviewing techniques as the study progressed. The translator was known to most of the participants. He had previously worked with them in the area of Health. This helped tremendously with developing rapport at the beginning of each interview.

Data content is good because many responses were thoughtful and detailed. There is sufficient depth and breadth and in the interviews that were recorded, the nuances in each response have been captured. The responses are generally long and well developed. Participants talked about their personal experiences. The focus groups that were carried out had a variety of responses.

Most of the literature on the topic of overweight and obesity used quantitative methods and presented prevalence statistics. Qualitative research is also very important to provide an in-depth understanding of issues pertinent to youth as understood through their own experiences and perceptions of their realities. Most of the youth interviewed suggested names of other famous young people as role models for bringing health messages to youth.

A pilot study is necessary to determine the types of health messages that will be effective and relevant to youth audiences using mobile technology social media and other channels of communication. Implementation of any form of health intervention will be effective and sustainable if the youth of the country are involved in making an impact in their communities. Financial support from international and regional institutions as well as private donors would be needed for piloting these interventions.

Public health implications

Our hope is that the results from this study will be useful for the collaborators at the Eastern Mediterranean Public Health Network (EMPHNET) and Emory University researchers to develop obesity prevention programs that are culturally appropriate and community-based for the people in Jordan. Most people in Jordan are aware of the importance of physical activity and of the negative health effects of an unhealthy diet. Several people are taking steps towards a healthier lifestyle by modifying risky behaviors and overcoming barriers to good health. This is a demonstration that there is potential for change.

Young people in the Middle East and EMR are participating in defining their needs and in bringing about change in their lives. Community transformation is possible when members of the communities engage their youth in identifying problems and implementing appropriate solutions. Youth perspectives of overweight and obesity are important in understanding the problem and finding sustainable solutions. Future health interventions should listen to the voices of youth in developing and implementing programs that increase their understanding of the causes and consequences of obesity, so as to be relevant, effective, and sustainable.

Conclusions

The burden of NCDs (e.g., diabetes, cardiovascular diseases, cancer, obesity) has become a globally recognized public health threat. Jordan is a country with high NCD morbidity and mortality. Prevalence of obesity in Jordan will continue to increase from 35% as predicted if no action is taken now.

In-depth interviews of key informants and youth 18-35 years old as well as focus group discussions were carried out in Jordan to evaluate the feasibility of using mobile technology and social media to increase awareness of modifiable risk factors that influence NCD prevalence in

Jordan. Participants were aware of the risky behaviors associated with overweight and obesity. Most agreed that reduced levels of physical activity and a shift from traditional Jordanian diet to a unhealthy diet were risk factors for overweight and obesity. Exposure to heavy marketing of unhealthy foods, particularly in urban areas, was increasing intake of fast foods that were cheaper than traditional food and delivered to home and work places free of charge. Many barriers to changing these risky behaviors were discussed. We attempted to understand these barriers in their social context.

All of the participants indicated that they use at least one mobile phone, and that a large proportion of Jordanians own multiple mobile phones including a smart phone for their personal use. There was universal agreement amongst the participants that lifestyle change interventions received via mobile phone Short-Message Service (SMS) text messages would be deleted unopened. FacebookTM was considered to be a more economical and effective method of receiving health messages that target youth. Other channels of communication and message design to heighten messages effectiveness and to move youth to change behavior were also suggested. Youth in Jordan were looking for positive role models to bring effective health messages. Our qualitative study was important to provide an in-depth understanding of youth experiences and perceptions of their realities. Results of this first qualitative research will inform pilot studies that use social media coupled with other communication strategies to raise awareness of obesity risk factors among youth in Jordan and change lifestyle behaviors that increase morbidity and mortality due to NCDs.

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Appendix A

Interview Guides

Key-Informant Interview Guide

Research Question: *How can mobile technology and social media be used to bring health messages about overweight and obesity to Jordanian Youth?*

Study Population: Male and Female adults (about 15) who represent different segments of the society, living and working in Jordan.

In-Depth Interview Guide (approximately 60 minutes)

I. Introduction.

Assalamu alaikum! First, I would like to thank you for agreeing to the interview.

My name is Ameena, and I am studying the problem of overweight and obesity in Jordanian youth. I would like your help in understanding the kinds of mobile technology and social media that are used by Jordanian youth and if you think that mobile technology like texting and FacebookTM can be useful for broadcasting health messages to youth. We want to raise awareness to healthy lifestyle and behaviors that can prevent and control obesity amongst youth.

I am working with the Eastern Mediterranean Public Health Network in Amman to prevent and control obesity in Jordan.

Your personal experiences are very important for us, so please feel free to share your personal experiences on the issues we discuss or any other relevant issues you feel are important.

The interview will take about an hour and your participation is completely voluntary.

Whatever you say will be completely confidential and will only be heard by those involved in the project.

Your name will not be shared with anyone.

If you don't feel comfortable with a question or would like to end the interview, please let me know at any time.

I would like to ask your permission to record our conversation so that I can capture accurately the points you share.

May I record our conversation? (get signature on consent form)

Do you have any questions before we begin?

Warm-up questions:

What kinds of food do you think Jordanian youth like to eat when they are with their friends and family?

[Probe: home cooked, fast food?]

What types of exercise do youth typically engage in Jordan? [Probe: walking, running at the gym, weightlifting, karate, etc.]

Main Questions:

Let us talk about the use of mobile technology for health messaging:

Do you think mobile technology could be used for health messages? Please explain

[Probes: texting on a cellphone, PC tablet, ipad other?]

Do you think social media could be used for health messages? Please explain.

Do you think Jordanian youth would like to receive health messages that promote a healthy lifestyle through mobile technology?

What kinds of health messages do you think can be sent via mobile technology?

[Probes: messages that increase knowledge, messages asking for action]

How can health messages sent through mobile technology be effective in bringing about changes in lifestyle behaviors in Jordanian youth?

Closing questions

We are almost at the end of the interview. I would like to close with a few general questions.

Of all the types of media that we talked about, what do you feel is the **best type of technology** to bring health messages to youth in Jordan?

What would be **the best type of message** you think youth in Jordan would respond to?

What would be **the most effective type of message** you think youth in Jordan would respond to?

What other types of mobile technology or social media would you recommend for mhealth messaging?

Is there anything else that you'd like to share that we have not talked about?

Thank you very much for taking the time to participate in the interview and for sharing your thoughts and concerns.

If you have any further questions feel free to contact me. My contact information is on the information sheet.

(One page information sheet on NCDs, Obesity, Lifestyle risk factors, and EMPHNET contact information will be provided at the end of the interview to each informant interviewed)

Youth Interview Guide

Research Question: *How can mobile technology and social media be used to bring health messages about overweight and obesity to Jordanian Youth?*

Study Population: Youth ages 18-36 years, (about 20) both male and female, living in rural and urban locations in Jordan.

In-Depth Interview Guide (approximately 60 minutes)

Introduction.

Assalamu alaikum! First, I would like to thank you for agreeing to the interview.

My name is Ameena, and I am studying the problem of overweight and obesity in Jordanian youth. I would like your help in understanding the kinds of mobile technology and social media that you use amongst your friends and if you think that mobile technology like texting and Facebook™ can be useful for broadcasting health messages to youth like you. We want to raise awareness to healthy lifestyle and behaviors that can prevent and control obesity amongst youth.

I am working with the Eastern Mediterranean Public Health Network in Amman to prevent and control obesity in Jordan.

Your personal experiences are very important for us, so please feel free to share your personal experiences on the issues we discuss or any other relevant issues you feel are important.

The interview will take about an hour and your participation is completely voluntary.

Whatever you say will be completely confidential and will only be heard by those involved in the project.

Your name will not be shared with anyone.

If you don't feel comfortable with a question or would like to end the interview, please let me know at any time.

I would like to ask your permission to record our conversation so that I can capture accurately the points you share.

May I record our conversation? (Get signature on consent form)

Do you have any questions before we begin?

Warm-up questions:

What kinds of food do you like to eat when you are with your friends and family? [Probe: home cooked, fast food, Junk food?] Follow up questions on nutrition.

What types of exercise do you like to do with your friends and family? [Probe: walking to work or school, using gym after work, etc.]

Main Questions:

Let us talk about the use of mobile technology for health messaging:

What types of mobile devices do you use? [Smartphones, tablets, eReaders]

What type of social media do you use?

Do you think health messages that promote a healthy lifestyle can be sent via mobile technology?

[Probes?]

Do you think health messages that promote a healthy lifestyle can be sent via social media? [Probes?]

How would you like to receive health messages that promote a healthy lifestyle?

What kinds of health messages do you like to see via mobile technology? [Please explain.] [Probes: messages that increase knowledge, messages asking for action]

Do you think that health messages sent through mobile technology can be effective in bringing about changes in lifestyle behaviors in Jordanian youth?

Closing questions

We are almost at the end of the interview. I would like to close with a few general questions.

Of all the types of media that we talked about, what do you feel is the **best type of technology** to bring health messages to youth in Jordan?

What would be **the best type of message** you think youth in Jordan would respond to?

What other types of mobile technology or social media would you recommend for mhealth messaging?

Is there anything else that you'd like to share that we have not talked about?

Thank you very much for taking the time to participate in the interview and for sharing your thoughts and concerns.

If you have any further questions feel free to contact me. My contact information is on the information sheet.

(One page information sheet on NCDs, Obesity, Lifestyle risk factors, and EMPHNET contact information will be provided at the end of the interview)

Appendix B

Photographs of Jordan

By Ameena Nalim, 2014.

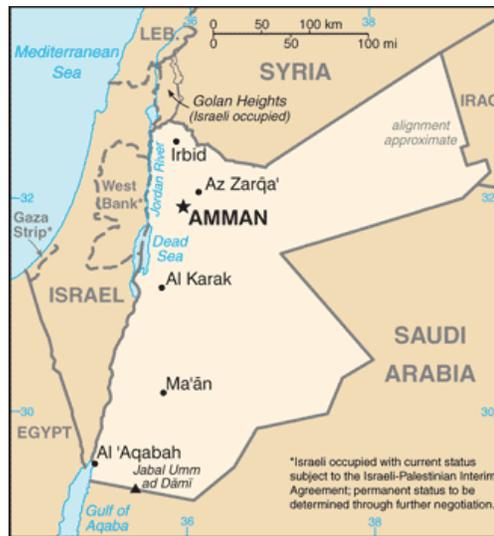


Exhibit 1. Map of Jordan showing the capital city of Amman (courtesy of CIA Factbook)



Exhibit 2. East Amman, a less affluent area than West Amman



Exhibit 3. A small health clinic in Rajeb, a rural village in Jordan, has one resident doctor. Rajeb Wellness Day was included a bus ride to Dibeen Nature Reserve.



Exhibit 4. A Health Walk in support of non-communicable disease (NCD) prevention in Arjan, a hillside village that staged a Health Day and Health Kitchen in collaboration with EMPHNET.



Exhibit 5. A vest and hat provided by EMPHNET and a poster in support of NCD prevention worn by the supporters who walked during the Health Walk in Ajloun and in Arjan



Exhibit 6. Exercise Room in Rajeb village close to the Health Clinic and set up by EMPHNET with support from local and international donors. It has several exercise machines and NCD prevention education materials.



Exhibit 7. Youth volunteers at the Youth Counsel in Ajloun



Exhibit 8. Women, men, and children demonstrate support for NCD prevention and control in their communities. A Health Walk organized by the Comprehensive Health Center, Ajloun Health Directorate



Exhibit 9. Traditional Jordanian rice dish “*Mansaf*” rich in nuts, raisins, and spices, served with meat.