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Grenadian Women's Perspectives on Screening for Breast and Cervical Cancers: A Participatory Approach to Understanding Prevention

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Abstract

Breast and cervical cancers present a heavy disease burden on countries with a limited resource base. This study explored the behavioral determinants that facilitate breast and cervical cancer screening among women within the cultural context of Grenada. One focus group discussion was held within each of the seven parishes of Grenada with women between the ages of 21 and 64 years with no history of abnormal cells of the breast or cervix. Four major themes emerged from the data, including (1) social interpretation of breast and cervical cancers, (2) price of participating in screening, (3) facilitators to screening, and (4) preferred methods of communication. In addition to basic information on cancer prevention, educational campaigns must address health literacy and the social interpretations of breast and cervical cancers in this population, particularly the persistent stigma. The results of this study highlight potential issues faced in limited-resource settings that should be acknowledged.

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Keywords

cervical cancer; breast cancer; screening; Caribbean; Grenada; focus groups; prevention

Background

Among women, breast cancer is the most commonly diagnosed cancer, and cervical cancer is the third most common worldwide (American Cancer Society, 2015). Globally, incidence rates for these cancers continue to increase despite the availability of effective screening tests. In 2012, approximately 1.67 million and 528,000 new cases of breast and cervical cancers, respectively, were diagnosed in the world (Ferlay et al., 2012). This compares to 1.3 million and 529,000 cases in 2008 (International Agency for Research on Cancer, 2010). Alarmingly, over 50% of breast cancer cases and more than 80% of cervical cancer cases occur in developing countries, of which the Caribbean region is a subset (Ferlay et al., 2012). These cancers continue to create a pressing disease burden on resource-poor countries such as Grenada.

The state of Grenada includes the islands of Grenada, Carriacou, and Petite Martinique and covers a land area of 344 km^2. Grenada is located at the southern end of the Windward Islands, about 100 miles north of Venezuela in the Southeastern Caribbean Sea. The estimated population of Grenada was 111,764 in 2010. More current numbers are available from the World Health Organization (WHO) website (http://www.who.int/gho/countries/grd.pdf?ua=1). Malignant neoplasm was reported to be the leading cause of death in Grenada in 2006 and in 2010, accounting for approximately 20% of all deaths (Pan American Health Organization, 2012). Breast and cervical cancers account for 16% and 9%, respectively, of all cancer deaths for women in Grenada (Pan American Health Organization, 2013).

According to Luciani, Cabanes, Prieto-Lara, and Gawryszewski (2013), age-standardized mortality rate for breast cancer, based on the most recent data, is relatively high in the "English" Caribbean, of which Grenada is a member. Records from the Grenada oncology unit indicate that the number of newly diagnosed breast cancer cases increased from 13 cases in 2009 to 38 cases in 2014. Additionally, the age-standardized mortality rate increased from 7.3 in 2000 to 16.9 in 2009 (Luciani et al., 2013). This rate is higher than the WHO Americas region, lesser developed regions (LDR), and global age-standardized rates of 14, 11.5, and 12.9, respectively (Ferlay et al., 2012).

Cervical cancer continues to contribute to the burden of disease in Grenada. Although cervical cancer is one of the most successfully controlled cancers as a result of the Papanicolaou test (Pap smear), which detects cervical cancer and precancerous lesions, developing countries have not benefited from these

advances. There is a limited capacity to prevent as well as treat cervical cancer as prevention programs are either unavailable or underfunded because they compete with other priorities (Jones, 1999; Ngoma, 2006; Sherris, Herdman, & Elias, 2001). Between 1996 and 2000, the age-standardized incidence rate was estimated to be 60.7 and the age-standardized mortality rate 9.7 (Asulin et al., 2004). The mortality rate for 2000–2010 was an estimated 16.7/100,000 (Bahadoor-Yetman et al., 2013), an almost twofold increase to the previously calculated rate and higher than the rates at the global, lesser developed countries (LDC), and WHO Americas regions at 6.8, 8.3, and 5.9, respectively. The prevalence rate for this period was 52.4/100,000 women 15 years and older (Bahadoor-Yetman et al., 2013). This is of concern, because low cost screening using the Pap test is available country-wide and because mortality rates from cervical cancer have been decreasing for countries in the Americas (Luciani et al., 2013).

Although the causes and natural histories of these two cancers are different, the public health approaches to these diseases are similar. Breast and cervical cancer mortality can be reduced if the cancer is detected early. Increasing access to and improving quality of screening programs have been identified as key components of effective programs for the early detection of breast and cervical cancers in low-resource settings. Mammography, breast self-exam, and clinical breast exams can be used to detect asymptomatic breast cancer. However, screening mammography has proven to be the most effective method (Nyström et al., 2002) and can help to reduce the number of deaths from breast cancer among women aged 50 to 74.

Grenada does not offer free mammography-based screening (Luciani et al., 2013), nor is the service offered at government clinics. Nevertheless, the service is available through private practitioners at a relatively high cost. For this reason, there are no available data on rates of mammography. Breast self-exam and clinical breast exams are encouraged in the absence of affordable mammography (C. Baptiste, personal communication, October 22, 2015).

Population-based screening, using the Pap smear test, has significantly reduced rates of cervical cancer in developed and developing countries. Although the Pap test is available in Grenada at government clinics at a low cost, coverage rates are relatively low. Cervical cancer screening in Grenada is performed within each of the seven health districts, which consists of seven health centers, 30 medical stations, and the Grenada Planned Parenthood Association. The data by parish show that Pap screening rates appear to be steady between 2011 and 2013. For example, from 2011–2013 in St. George, the numbers of Pap tests completed were 272, 304, and 216, and in Carriacou the numbers were 38, 25, and 34 (Grenada Ministry of Health, 2014). The data clearly indicate that coverage levels are insufficient, as demonstrated by the relatively high rates

of breast and cervical cancers and low Pap test rates. These survival statistics can be improved with the use of effective screening and treatment strategies (Ngoma, 2006); however, cancer diagnosis in these populations is commonly made in advanced stages (Sener & Grey, 2005). Therefore, efforts to increase screening coverage levels among women in Grenada are imperative.

A thorough review of literature revealed little research on the perceptions and attitudes of women in the Caribbean toward breast and cervical cancers. A survey by Ncube, Bey, Knight, Bessler, and Jolly (2015) found that in Portland, Jamaica, women who did not know where to go for a Pap smear were 85% less likely to have been screened. A focus group study in Barbados found that the most frequent misconception of the Pap smear was that it was for the detection of sexually transmitted infections (Christian & Guell, 2015). In terms of breast cancer, a focus group study on breast cancer screening barriers among Barbadian women found that many women expressed fear about mammography and its potential consequences including social stigma and losing romantic relationships (Granado, Guell, Hambleton, Hennis, & Rose, 2015). A major cultural barrier to breast screening in Tobago was the cultural belief that no matter what they did, there was no way to prevent breast cancer (Modeste, Caleb-Drayton, & Montgomery, 1999). These studies are important contributions to the literature on breast and cervical cancer screening; however, they are in the context relevant to larger islands with more resources or those classified as high income countries by The World Bank (2015).

The purpose of this research study was to explore the behavioral determinants that facilitate breast and cervical cancer screening among women within the cultural context of Grenada. Further, we will examine how attitudes toward screening are influenced by the availability of screening within the existing health system.

Method

A community-based participatory research approach was used to optimize involvement and increase the research project's chance of success. Key stakeholders were invited to a planning meeting to discuss the potential benefits of the research project. These members formed an interprofessional advisory board composed of nurses, physicians, public health practitioners, and community members representing the Grenada Medical Association, Grenada Nurses Association, Grenada Heart Foundation, Grenada Cancer Society, Pink Ribbon Society, and Grenada Public Health Association. Stakeholders at this initial meeting provided input on the focus group guide, recruitment flyer design, and strategies for disseminating information regarding the study and recruitment. As a result of these consultations, the focus group guide and recruitment flyer were tailored for cultural appropriateness. The resulting focus group guide was piloted among a sample of nursing students and revised based on the feedback received.

The research team used a qualitative design of focus group discussions for data collection. Ethical approval was obtained from the institutional review boards (IRB) at St. George's University and Nova Southeastern University. To ensure that opinions were obtained from across Grenada, one focus group discussion was held in each of the seven parishes. To achieve this, women were purposefully recruited by age and parish from August to November 2014. The goal was to recruit a minimum of seven women in each focus group because previous literature indicated that an optimal focus group would consist of five to seven respondents (Debus, 1988). Eligible participants were women between the ages of 21 and 64, a Grenadian citizen living on the island, without a previous diagnosis of breast or cervical cancer.

Recruitment

Members of the project team promoted the study on a local television station and posted flyers at government ministries, health clinics, supermarkets, bus stops, beauty salons, pharmacies, banks, and other business places. Supporting organizations also posted flyers on their Facebook pages. The recruitment flyer provided information on eligibility criteria for participation and the contact information for the project manager. Because of insufficient recruitment numbers during Phase 1, a second phase of recruitment was implemented. Phase 2 involved direct, face-to-face recruitment of eligible people. The project team visited each parish, handed out flyers, provided information about the study, and collected contact information. The project manager contacted interested people to confirm their eligibility and to share the time, date, and venue for the focus group discussions.

Focus Group Discussion

Once the required number of people was recruited within a parish, the focus group discussion was scheduled at a convenient location. Refreshments were served before the start of each session to establish rapport. Participants read the informed consent, were given an opportunity to ask questions, and then completed a demographic questionnaire. Next the focus group moderator, a local, female clinical nursing instructor, introduced herself and the note taker. She explained the procedures and used the semistructured interview guide to initiate the discussion. The semistructured interview guide comprised 19 questions on participants' knowledge, screening barriers and facilitators, information sources, and potential channels of information related to breast and cervical cancers. Each session lasted approximately 90 minutes and was tape-recorded along with handwritten notes being taken. A token of $10 XCD ($4 USD) was given to each participant at the end of each session.

Analysis

Each focus group was audiotaped, which was transcribed verbatim by a professional transcriptionist and reviewed for accuracy. A codebook with operational definitions was created using the themes that were extrapolated from the data using thematic analysis (Thomas & Harden, 2008). Two team members individually coded a small sample of focus group transcripts, and they reconciled through discussions any differences in coding. Once thematic saturation was achieved, a revised codebook was developed. The remaining transcripts were coded by a single coder using NVivo 10 (QSR International Pty Ltd).

Results

Forty-seven Grenadian women participated in the study. Their demographic characteristics are presented in Table 1. All of the women indicated that they were never previously diagnosed with any form of cancer. The results are organized by the following emerging themes: (1) social interpretation of breast and cervical cancers, (2) price of participating in breast and cervical cancer screening, (3) facilitators to screening, and (4) preferred methods of communication.

Table 1
Focus Group Participants' Demographics

Demographics	***N***	**%**
Age		
20–30 years	18	38.3
31–40 years	16	34.0
41–50 years	7	14.9
51–60 years	4	8.5
61–70 years	2	4.3
Employment Status		
Employed	31	66
Unemployed	16	34
Education		
Primary School	7	14.9
Secondary School	18	38.3
Community College	12	25.5
University	8	17.0
Trade or Technical School	2	4.3

Table 1 (cont.)

Demographics	*N*	%
Monthly Income (East Caribbean Dollar [XCD])		
< $500	5	10.6
$500–$1,500	16	34.0
$1,501–$3,000	5	10.6
$3,001–$4,000	3	6.4
No Response	18	38.3

Note. $1 USD = $2.70 XCD.

Social Interpretation of Breast and Cervical Cancers

The initial focus group interview guide questions were asked to gain an understanding of women's knowledge of breast and cervical cancers and related screening. It was clear from the responses that the women's interpretations of breast and cervical cancers are related to the belief that something that occurs physically is a cause for cancer. It was clear that these beliefs were heavily influenced by their social contexts.

Abuse. Several participants spoke of different forms of abuse as being a cause of either breast or cervical cancer. According to participants, women who experience abuse in their lifetime may have an increased risk of later developing breast or cervical cancer: ". . . I heard people talk about because, oh she was abused, they beat her up so much that she get breast cancer, she get knock up in her breast…" (FG1, R3). The participants also believed that women who have been abused sexually are at higher risk of breast and cervical cancers: "Sexual abuse can cause breast and also cervical cancer [but] I don't think with the breast it's true" (FG2, R3).

Sexual activity. Promiscuity or sexual activity was also cited by focus group participants as a cause of breast and cervical cancers. For example, one participant noted, ". . . Because she have too much sexual partners, it is believed that because of that you tend to get cancer, also cervical cancer . . ." (FG1, R3). Conversely, a lack of sexual activity was also mentioned as a cause for cervical cancer: "Sometimes they say like when you not sexually active, like people will say stay there and let all the thing pile up inside you there and you get this, some people believe for the cervical cancer" (FG4, R6).

Breastfeeding. Another theme mentioned during focus group discussions as a cause for breast and cervical cancers was the act of breastfeeding children. One participant shared a belief that children would be at an increased risk of breast cancer if their mother had breast cancer while breastfeeding them. Another participant cited difficulty with breastfeeding as a potential cause of cancer tumors:

> I use to hear my grandmother talking about it back then growing up, my first sister had her first son and she had some problems with the flow of the breast milk and she was like you have to knead it with the corn stick otherwise it go stay there and form cancer. If the milk don't flow up it will stay there and form a lump. (FG4, R7)

Barriers and Price Associated With Screening

Women expressed many barriers related to the price of screening. Price in this case refers to what women must do to obtain breast and cervical cancer screening. This may be monetary or something intangible that women consider valuable.

Cost of care. In each parish, focus group participants frequently cited the cost of health care as a barrier to receiving care: ". . . If it's costly sometime you may not have the money to go and get it done" (FG5, R1). In addition, the cost of care was also mentioned as a reason that Grenadians may postpone seeking preventive care if they are asymptomatic. One participant stated, "The cost attached to it so sometime they might find that they don't have no signs or symptoms but just to get up and go and pay money to do that and they could use the money to do something else" (FG5, R4). Another participant said,

> . . . Now when we go to the clinic, usually it is because, [the free clinic – the government clinic] it's usually when we just had a child or so then we could get it for free but we would have to pay after. If it could be easily assessable in terms of cost, it is cheaper then, that would for me make women more willing to do it. (FG2, R11)

Time. In addition to monetary affordability, women were clear that another factor to consider is time. Many of the working women mentioned that it may not be possible to take time off from work to get screened, even when they are willing. One participant shared her personal dilemma: ". . . Based on what you doing and where you working you just can't afford to waste time . . . yes you want to go, but the job is more important because you need the money and you just don't have the time" (FG2, R3).

Discomfort. Feelings of discomfort with the testing procedure also surfaced as a deterrent for participants to undergo a screening procedure. One participant stated, "I'm talking from my experience, I always hear people talking about Pap smear and I always scared to go and do it because the experience friends tell me . . . that they push it in and it hurt so much and so uncomfortable so I'm so scared . . ." (FG3, R7).

Discomfort was expressed about not only the procedure, but also the feeling of being exposed in front of health care providers. Several participants re-

ported being uncomfortable as a result of either being subconscious about their bodies or being exposed to several health care providers. This concern, which may not present itself until in the health care setting, may prevent women from being screened, even when they have an initial interest in their health care.

> . . . Reading up about it that made me a little bit more willing to do it . . . when I went to the clinic it was really uncomfortable for me going to do the Pap smear because actually I had reach and I had taken off my clothes, was just to actually get up onto the bed, but then when I saw the amount of persons in the room it made it really uncomfortable for me, so I just changed my mind and went back home. (FG2, R10)

Confidentiality. Even when access to health care was free, barriers still existed that prevented women from participation in screening. A major barrier was health professionals' confidentiality measures. One respondent mentioned, "I would go to a place where I could get the services done one time, and secondly they have to be confidential in that place. Whether public or private, they have to be confidential" (FG4, R6). Several participants reported having concerns as to whether their care and personal information would be shared with those outside of the health facility by nurses: "Some people may want to go to do it . . . that nurse is not trustworthy, she might talk so I not going there . . . must be somebody confidential that you could go and expose you self to do those things" (FG6, R2).

Despite many confidentiality concerns, a few women felt that concerns about confidentiality should not supersede taking preventive health measures. Instead, women should put additional effort in finding a practice with which they are more comfortable: "I would like to admonish people that even if they find a nurse or nurses in a particular area not confidential, because of their own health they look for somewhere else . . ." (FG4, R1).

Facilitators to Screening

Financial incentives. Providing financial incentives to cover the costs of services (four parishes) and access to care (two parishes) was identified as a major facilitator to this population being screened. One woman stated, ". . . According to the cost of the test if you're not working it may be difficult for you to do the test and sometimes if it's not something offered by government you may have to forego the test" (FG1, R1). Other participants also mentioned provision of incentives during nationally recognized cancer awareness months: "Since we celebrating cancer month, October is cancer month, at least we should have some incentive, give us a special, like maybe a discount for the mammogram, this is one incentive" (FG7, R1).

Participants also brought attention to some of the free or low-cost services available, but most of these are provided through health clinics or health

centers. These facilities are an additional barriers, as they are typically associated with concerns regarding confidentiality among participants, which was another barrier raised by four of the parishes. For example, one participant mentioned, ". . . If you don't have the money to go by a private doctor, you have to go by a public doctor, health center" (FG5, R4). Another noted, "There's an issue with confidentiality for the health centers" (FG5, R6).

Knowledge. Knowledge was also identified as a facilitator to screening participation. According to participants, increasing education and knowledge may increase cancer screening: "I think what would make people want to do Pap smear is education; I think lack of knowledge is preventing people . . ." (FG2, R3). In addition to an increased general knowledge about cancer, participants also felt that they needed to learn the process for when to initiate screening for cancer and that they needed clarification on conducting breast self-exams. This points to a need for increased health literacy in the population. For example, one participant stated,

> . . . The next one could be educating, educating us on where we should have it, and this is cancer month, we need to be educated on where, what's the different changes you notice in your body to have it done, giving us the discount, things to encourage people to grow, so we have this thing going on now so we'd want to be a part of it. (FG7, R1)

Preferred Methods of Communication

Face-to-face. Participants provided information on their preferred methods of communication to receive information about breast and cervical cancers. A common subtheme shared across all parishes was the use of communication methods that include personal interaction. Participants felt that communication was better when it was more personal and "face-to-face." One of the benefits women noted about this type of encounter was that the health educators conducting the sessions ". . . would be a good source of information, people could ask questions and get answers . . ." (FG2, R3). The participants tended to be receptive to various face-to-face encounters. Some preferred small groups for ". . . open discussion with the facilitator and the people there" (FG7, R1), whereas others were open to more-professional settings.

Some participants thought residents of Grenada would be receptive to settings such as workshops and conferences: "My preferred method will be a forum like a workshop with recent researches and stuff like that" (FG4, R1). Women also recommended having these workshops in locations where women work or congregate often.

Another participant also thought a workshop hosted by or conducted in their place of employment would be ideal for those with schedules that are less flexible: ". . . Some people based on the time they work maybe it would be nice

that the work place arrange some kind of workshop if it's a two day workshop so you could get all the information ...for women to get more educated on that breast cancer or cervical cancer" (FG6, R9).

Media. Although mentioned less frequently, different forms of media such as "television programs and radio programs" (FG7, R3) were also mentioned as ways to reach the target population to educate them about breast and cervical cancers. However, participants also noted that these formats may not be ideal for a couple of reasons. One reason participants thought that technology might not be suitable for the population was a lack of access to technology: "Not everyone have a television so that why they could come and have a small meeting in the different parishes" (FG5, R1). Another mentioned limitation was that media formats do not allow for personal interaction with individuals:

> Its case where you have that kind of one-on-one interaction, to me the radio and the television, the mass media you could use them, but in terms of that interactive one-on-one connection, we don't get it. They will just give the information and the information will be more generalized, but one you have persons who is sitting here and you could see that persons you could actually feel the passion . . . with those kind of sessions we could actually learn how to do a breast examination. (FG3, R3)

Discussion

This qualitative study explored the attitudes and perceptions among a sample of Grenadian women without a previous breast or cervical cancer diagnosis toward breast and cervical cancer screening. The results of this study contribute to the knowledge base of breast and cervical cancer screening in the Caribbean, with a special focus on a smaller Windward island with a limited resource base. By conducting focus groups with women without a previous diagnosis of breast or cervical cancer, researchers were able to capture the attitudes and perceptions of women without a firsthand experience with cancer treatment in Grenada, thus limiting the influence of a survivor's knowledge and experience on the undiagnosed women's responses.

This study aimed to reach women from all seven parishes in an effort to compare similarities and differences between women based on the parish in which they live. The researchers hypothesized that women living in the capital of St. George, where the general hospital is located, would have different perceptions of breast and cervical cancer than women living in the more rural parishes. However, no major differences were found among the women, as each theme was present in a minimum of six of the seven parishes. All the women agreed that there is a lack of information on the importance of breast and cervical cancer screening in Grenada.

The first theme of social interpretation of breast cancer was heavily influenced by the women's social contexts and cultural beliefs related to sex and sexuality. Women saw their cancers as taboo and as likely caused by sexual activity, both voluntary and involuntary sexual abuse. As a result, women saw cancer as a social stigma and something that they should not share with others, including family. A few women mentioned physical trauma to the breast and breastfeeding as causes for breast cancer. Some of these beliefs were learned from their grandmothers. Likewise, Swinney and Dobal (2011) conducted a study with older African American women who stated that they were taught by their mothers that breast cancer could result from hitting or squeezing the breast and from clogging of the breast due to not breastfeeding. Therefore, it is important that women, a significant source of information for children, be educated so that they can impart accurate information to their children. The women in this study also mentioned indiscriminate sexual practices as a cause of cervical cancer. This finding is supported by Brown, Wilson, Boothe, and Harris (2011), who conducted focus group discussions with Caribbean women, among others, and found that they believed that multiple sexual partners and unprotected sex cause cervical cancer. These are risk factors, but it is important that practitioners highlight the importance of screening as a prevention tool. The women in this study also believed that physical or sexual abuse could result in the development of breast or cervical cancer. A similar finding of the belief that cancer is caused by a bruise or a sore is the results of a study conducted among Caribbean women by Consedine, Magai, Spiller, Neugut, and Conway (2004). These misconceptions may increase women's vulnerability to breast and cervical cancers, diminish the relevance of screening, and thus contribute to increased rates of breast and cervical cancers.

Women discussed whether the local beliefs regarding the potential causes mentioned were accurate, indicating a need for more education on cancers that affect women in an effort to dispel local myths related to susceptibility. An opportunity exists for local organizations dedicated to reducing cancer incidence to play a larger role in addressing the deeply ingrained stigma associated with cancers that affect women.

The second theme is related to the price of screening. Price in this case refers to what women must do to obtain breast and cervical cancer screening. This may be monetary or intangibles. In Grenada, the minimum wage is $800 XCD/month or about $296 USD/month. Women described the monetary cost of screening locally along with the potential expense of seeking treatment abroad if cancer is detected. It is important to find ways to encourage screening for prevention, as it has been found that the demands of chronic care for a disease such as cancer can be crippling and contribute to poverty, because most patients pay for care directly out of pocket (Chan, 2010). Taking time off from work to attend an appointment during work hours was cited as an example

of an intangible price. The women suggested having educational sessions supported by employers so that the sessions can occur during work hours. This may be a potential channel for outreach. The perceived lack of confidentiality in health care facilities was a major concern for the women. They were not confident that nurses and hospital staff would keep their diagnosis confidential if cancer was detected. It has been found that women in small communities may be inhibited from seeking health care services because of confidentiality concerns (Committee on Health Care for Underserved Women, 2015). This was linked to the stigmatized status of cancers that affect females in Grenada, as women feared the news of a potential diagnosis becoming public.

The third theme of facilitators to screening was closely related to price in that access to convenient screening appointments was an issue in addition to the availability of local cancer treatment. Some women felt that Grenada did not have access to a mammography machine or the resources to read the results. Many others suggested subsidized mammography screening as an incentive to screening. The need for increased knowledge was mentioned as a major facilitator to increasing breast and cervical cancer screening in Grenada and relates to the fourth theme of preferred methods of communication. Many focus group participants suggested the organization of community educational sessions in which the women could interact with other Grenadian women. This is important given that Hodge, Stubbs, Gurgin, and Fredericks (1998) stated that for educational cancer prevention programs to be an effective tool, they must be designed in culturally acceptable styles of communication. Therefore, the preferred method of receiving information must be considered when developing any educational program.

Lack of knowledge may be related to low health literacy. Health literacy has been defined as a person's ability to obtain and use health information to make decisions (Nielsen-Bohlman, Panzer, & Kindig, 2004). Limited health literacy is associated with poor management of chronic diseases, poor ability to understand and adhere to medication regimens, increased hospitalizations, and poor health outcomes (Agency for Healthcare Research and Quality, 2015). In low-resource settings, the concept of screening to prevent disease is often not well understood (Committee on Health Care for Underserved Women, 2015). Therefore, it is important to not disregard the need for health literacy efforts that highlight the importance of adherence to breast and cervical cancer screening. Despite improvements in technologies to predict and detect cervical neoplasia, these technologies will not detect disease in women who have not participated in the prevention process, even with a perfect screening method (Leyden et al., 2005).

The next steps are planned to conduct this study in the other English-speaking Windward Islands to better understand this issue related to screening in settings similar to Grenada. Future research will also examine the quality

and availability of breast and cervical cancer treatment options in the English-speaking Windward Islands. A lack of treatment options inherently hinders clinicians' ability to treat their cancer patients in a holistic manner using best practices. It also creates an ethical dilemma for public health and clinical practitioners to recommend screening for women who will not have access to the proper treatment in the event that cancer is detected. Providing education without screening and treatment will raise hopes among women living in a medical system that does not have the resources to support their care (International Federation of Gynecology and Obstetrics, 2009)

Conclusion

This research study explored Grenadian women's perceptions of breast and cervical cancer screening. It is clear from the results that in addition to basic information on cancer prevention, educational campaigns must address the social interpretations of breast and cervical cancers in this population, particularly the persistent stigma related to cancers that affect females. Future health education efforts must also recognize the possibility of low health literacy rates among the population. The women who participated in this study identified many barriers to accessing breast and cervical cancer screening in the health care system and to understanding the importance of screening. The results have the potential to contribute to formative research for future social marketing campaigns. The aim of this study was to represent a range of perceptions to better understand the topic, rather than to collect a demographically representative sample. Therefore, these results are specific to Grenada and may not be generalized to all islands in the Eastern Caribbean. However, the results of this study highlight potential issues that may be applicable to similar limited resource settings that should be acknowledged and addressed.

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Assessing the Effect of a Health Education Intervention on Attitudes Toward Safe Motherhood Among Women of Reproductive Age in Eleme, Rivers State, Nigeria

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Abstract

Since the inception of the Safe Motherhood Initiative (SMI) by WHO, UNFPA and World Bank in Nairobi, Kenya, in 1989, several intervention programs have been instituted by stakeholders at governmental and nongovernmental levels, nationally and internationally, to implement the initiative's strategies to curb the high maternal morbidity and mortality rates in the developing countries of Sub-Saharan African and Asia. This quasi-experimental study had a sample size of 400 women, and the researcher used health talk, demonstration (of history taking, blood pressure, weight measurement to establish women's health status, etc.), and role-play exercises to investigate the effects of health education intervention on the attitudes of women of reproductive age toward SMI components of antenatal family planning and PMTCT of HIV and AIDS in Eleme, Rivers State, Nigeria. Findings revealed the intervention had a significant effect on the attitudes of women in the intervention group, who had a higher mean gain difference (.6250, 1.2350, and .2775) than did the control group (.4150, 1.0775, and .0325) in the posttest scores, F1 (397 = 70.077, p = .000, p < .05). However, statistically, there was no significant difference on attitudes toward SMI between the age groups of the women, F3 (394 = .079, p = .971, p > .05).

Keywords

effect; health education; attitude; women; reproductive age

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Nigeria's maternal mortality ratio of 1,100 maternal deaths for every 100,000 live births is one of the highest in the world (Bankole et al., 2009). High risk births persist in Nigeria, although patterns differ in the various regions. Mother's age, parity, or spacing of births made two thirds of all births high risk in 1990 and in 2003, and as a result, the country may be facing the most serious maternal mortality crisis in the world with more maternal deaths in childbirth than any other country except India. Nigeria comprises only 2% of the world's population, yet contributes up to 10% of the world's maternal deaths. As many as 60,000 Nigerian women die from pregnancy-related complications each year (Bankole et al., 2009). It is only because India has a population 8 times higher than that of Nigeria that it has a larger number of maternal deaths globally (Shiffman & Okonofua, 2007). The human rights community has raised concern that maternal mortality is preventable and avoidable and that compliance of international human rights treaties relating to women's access to health care is required to reduce maternal death (Maine, 1991).

The World Health Organization (WHO, 1977) stated that maternal death is the death of a pregnant woman or death of a woman within 42 days of the end of the pregnancy, irrespective of the age or location of the pregnancy; such death may be linked to poor management of pregnancy. However, death resulting from accidental or incidental causes but unrelated to pregnancy is not regarded as maternal death. In spite of concerted efforts by governments and various health organizations to mitigate maternal morbidity and mortality resulting from pregnancy and related issues, both continue to remain high, particularly in developing countries, and are on the increase in some of the countries (WHO, 2005).

Hemorrhage, sepsis, toxemia, ruptured uterus, and abortion with its complications are listed as the main causes of maternal deaths (Olise, 2007). For each maternal death, a corresponding 30 to 50 women suffer injury, infection, or illness (Ravindran & Berer, 2000). Consequently, children are deprived of their mother's love and nurturing, communities lose the women's paid and unpaid services and their contributions socially and economically to the development of their countries in particular and the world in general (Olise, 2007). According to the WHO Global Health Observatory (2016), globally, one third of total disability-adjusted life years (DALYs) in 2012 resulted from communicable, maternal, neonatal, and nutritional causes (these are referred to as "MDG conditions").

The Safe Motherhood Initiative (SMI) was launched in 1989 in Nairobi, Kenya, to create awareness of maternal mortality all over the world and to encourage governments, nongovernmental and United Nations (UN) agencies, and other stakeholders to strategize, synergize, and seek ways to end this public health tragedy (Family Care International, 2007). The SMI aimed at reducing the burden of maternal morbidity and mortality, in addition to providing a

framework for activities and empirical studies on how to improve the health of mothers in third world countries (Jowett, 2013). In the 19th century, Sweden's maternal mortality rate was similar to that of developing countries today. There was strong advocacy within the country to combat it and reach a goal of less than 300/100,000 live births. The Swedish government embarked on the strategy of training midwives to attend to all births. Norway, Denmark, and the Netherlands later used this approach with similar successes; therefore, several lessons can be learned from the West (De Brouwere, Tonglet & Van Lerberghe, 1998).

The Joint Committee on Health Education and Promotion Terminology (as cited in WHO Regional Office for the Eastern Mediterranean [EMRO], 2012) defines health education as "any combination of planned learning experiences based on sound theories that provide individuals, groups, and communities the opportunity to acquire information and the skills needed to make quality health decisions." "Health education aims at teaching individuals to gain appropriate knowledge and skills in order to motivate and enable them to live and behave in ways that promote, maintain and restore health" (p. 13). The knowledge and skills are acquired through awareness-raising and skill-acquisition educational methodologies. Rimer, Glanz, and Rasband (as cited in WHO EMRO, 2012) posited that the most effective health education interventions are evidence based and are based on theories and models.

In Rivers State, Nigeria, studies have been conducted to investigate various aspects of SMI. Uzoigwe and John (2004) studied maternal mortality in the University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria, in the last year before the new millennium. Findings of the study indicate that maternal death figures in the hospital are one of the highest in the world. Fears that the situation has not improved much were confirmed by Akani (2015), who stated that Nigeria accounted for 25% of maternal, newborn, and child deaths in Sub-Saharan Africa in 2014. Akani gave the alarming statistics while delivering the university's 116th inaugural lecture. Akani noted that Sub-Saharan Africa, which represents 11% of the world's population, contributes 50% to global maternal deaths annually. According to Akani, 4.7 million of the 4.9 million newborn and child births per year occur in that region, with Nigeria accounting for a significant percentage of this number. The risk of a woman dying as a result of pregnancy or childbirth in Nigeria is about 1 in 15, as opposed to 1 in 5,000 in developed nations. Additionally, an estimated 52,900 women and an estimated 250,000 newborns die from pregnancy-related complications annually.

Akani (2015) identified some of the factors responsible for the high statistics on the part of pregnant women as delay in decision making, lack of medical attention, and access to emergency care. Furthermore, Akani blamed the deaths on quacks, unskilled native midwives, shortage of health care fa-

cilities, lack of planning, traditional and cultural practices, female genital mutilation, unsafe abortions, and sexually transmitted infections. This confirmed the United Nation's source data of Nigeria's maternal mortality rate of 1,500/100,000 births in 1980–1987, which appeared to be among the highest in Black Africa. However, a story ("Nigeria Accounts for 13%", 2014) noted that data made available by the United Nations Population Fund (UNFPA) reveal that over the last 20 years Nigeria has made significant progress in reducing the maternal mortality ratio. However, it added that Nigeria has to make concerted efforts to reach the Millennium Development Goal of 300/100,000 (or under 20,000 annual deaths) by 2015.

Rivers State Government (RVSG) in the present democratic dispensation instituted several measures to raise awareness and provide maternal and child health care services. This is to enable her achieve the goals of the global Safe Motherhood Initiative and the set target of the Millennium Development Goal 5, that is, to reduce maternal mortality ratio by 75% in the year 2015, thus improving maternal health. These services and community outreach programs include consistent health education at the health facilities by nurses and community health officers, free medical care services, free obstetric services (free caesarean section inclusive). In addition, there is celebration of Maternal and Child Health Week and Safe Motherhood Day; these celebrations feature the distribution of free antimalarial drugs, free intermittent preventive treatment of malaria for pregnant mothers, and free immunization services.

Others are free family planning services and increase in the number of primary health care facilities in all wards of the local government areas (LGAs) in the state. However, the health education at the health facilities by nurses and community health officers is most often undocumented, making it hard to assess outcomes appropriately. Available records from the office of the Special Adviser to the Governor on Medical Statistics also reveal poor usage of health facilities in the LGAs for antenatal and delivery purposes (Lawson, 2012). This is in spite of efforts by the RVSG to achieve the opposite to reduce the maternal mortality ratio in the state by employing strategies such as a mass awareness campaign and community outreach programs.

Figure 1 shows data on utilization of antenatal and delivery services in some LGAs of Rivers State. The data show poor utilization of the health facilities in the LGAs of Rivers State for antenatal and delivery services (Lawson, 2012).

	LGA	2008				2009				2010				2011			
1	Obio-Akpor	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2	Emohua	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3	Etche	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4	Ogu-Bolo	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
5	Bonny	x		x	x	x	x	x	x	x	x	x	x		x	x	x
6	Andoni	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	Abua-Odual	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
8	Okrika	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
9	Omuma	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
10	Port-Harcourt	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
11	Ikwerre	x	x	x		x	x	x	x	x	x	x				x	x
12	Khana					x	x	x	x	x	x	x	x	x	x	x	x
13	Gokana					x	x	x	x	x	x	x	x	x	x	x	x
14	Akuku-Toru	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x
15	ONELGA					x	x	x	x	x	x	x	x	x	x	x	x
16	Asari-Toru	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17	Eleme		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
18	Opobo/Nkoro	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x
19	Ahoada-West					x	x	x	x	x	x	x	x	x	x	x	x
20	Ahoada-East					x	x	x	x	x	x	x	x	x	x	x	x
21	Tai														x	x	x
22	Degema													x	x	x	x
23	Oyigbo					x	x	x		x	x					x	x

Figure 1. Analysis of data on maternal health indices 2008–2011: Trends in utilization of antenatal care services in Rivers State LGAs. Data from Rivers State Office of the Governor on Medical Statistics, Lawson (2012).

A cross-sectional questionnaire-based study involving 112 mothers aged 15 to 49 years from Gokana LGA of Rivers State, Nigeria, was conducted by Moore, Alex-Hart, and George (2011). It was a community-based study on utilization of health care services by pregnant mothers during delivery in Nigeria. According to the researchers, poor utilization of health care services during delivery by pregnant mothers is still a major cause of maternal and childhood morbidity and mortality in Nigeria. The aim of the study was to determine the level of utilization of health care services by pregnant women during delivery in Gokana LGA of River State, Nigeria. The LGA has 12 health centers, and six health centers were selected through multistage sampling. One hundred twelve mothers were then selected by simple random sampling.

Out of the 112 mothers interviewed, 91(81.3%) were married, 13 (11.6%) were single, five (4.5%) were widows, two (1.8%) were divorced, and one (0.9%) was separated. Of these mothers, 97 (86.6%) had formal education and 15 (13.4%) had no formal education. Most of the mothers (37.5%, $n = 42$) were between the ages of 25 and 29 years. Of the mothers, 64 (57.1%) in their recent delivery used a health facility and 48 (42.9%) did not. Findings reveal

that factors responsible for nonutilization of health facility for delivery include long distance to health facility, 33 (68.7%); onset of labor at night, 40 (83.3%); unavailability of means of transportation, 37(77.1%); lack of money for transportation, 26 (54.2%); unsatisfactory services at health facility, 26 (54.2%); unfriendly attitude of staff of the health facility, 34 (70.8%); unavailability of staff at health facility, 32 (64.0%); lack of urgency at health facility, 36 (75.0%); and previous uneventful delivery at the health facility, 32 (66.7%). In conclusion, utilization of health care services during delivery in Nigeria is still poor (Moore et al., 2011).

"Pregnancy Outcomes Among the Ibani of Rivers State, Nigeria: Findings From Case-Studies" was conducted by Nwokocha (2006). The study was conducted in Rivers State of Nigeria. This area has 23 LGAs and a population of 3,187,864, per the 1991 census. Nwokocha studied the Ibani, an ethnic group inhabiting the Bonny Island, which consists of 14 kingdoms. Through examination of 19 cases, Nwokocha demonstrated evidence of the influence of beliefs and practices on pregnancy outcomes in places where the activities of individuals are strictly regulated by cultural norms and values. The result of the research showed that high fertility among the Ibani, as in most other communities in Sub-Saharan Africa, is explained by the value for children and large family size. In the case of the Ibani, where remarrying is allowed for women, each union makes a new demand on the women in terms of fertility. This implies that multiple marriages have a significant relationship with pregnancy and high fertility. A combination of factors has been identified as affecting pregnancy outcome among the Ibani.

Nwokocha's (2006) study provides data to affirm the links between sociocultural variables and pregnancy outcomes among the Ibani of Rivers State, Nigeria, with identification of communal and individual values, attitudes, and behaviors related to pregnancy. In conclusion, Nwokocha noted that the complexities surrounding analysis of these issues signals a need for a holistic understanding of events related to pregnancy. The researcher argues that although individuals are ascribed some freedom within the social system, in the choice of activities perceived as most rational to seeking pregnancy outcome, such independence is unwittingly guided by the norms and values of a society (Nwokocha, 2006).

Purpose of the Study

1. The purpose of this study was to assess the effects of a health education intervention using health talk; demonstration of history taking, blood pressure, weight measurement, and so forth; and role-play on attitudes of women of reproductive age toward SMI components of antenatal care (ANC), family planning (FP), and PMTCT of HIV and AIDS in Eleme, Rivers State, Nigeria. Improved implementation and evaluation

of current health education programs and the utilization of health facilities in LGAs for antenatal and delivery purposes by the women may result in improved maternal health and reduced maternal mortality. Demonstration of history taking, blood pressure, and weight measurement to establish women's health status and role-play exercises were intended to convince the women of the care they would receive and benefits they would derive from patronage of the health facilities during pregnancy and childbirth.

2. This study also intended to find out if health talk; demonstration of history taking, blood pressure, weight measurement, and so forth; and role-play exercises would have an effect on the attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS based on selected demographic characteristics of different age groups (see Table 1 for age group matrix) of women of reproductive age in Eleme, Rivers State, Nigeria.

Research Questions

These research questions were answered in this study:

1. Do health talk; demonstration of history taking, blood pressure, and weight measurement; and role-play exercises have an effect on attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS?
2. Do health talk; demonstration of history taking, blood pressure, and weight measurement; and role-play exercises have an effect on attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS between the age groups of the women?

These hypotheses were tested in the study:

1. Health talk; demonstration of history taking, blood pressure, and weight measurement; and role-play exercises will not have an effect on the attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS.
2. Health talk; demonstration of history taking, blood pressure, and weight measurement; and role-play exercises will not have an effect on the attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS between the age groups (see Table 1 for age group matrix) of the women.

Theoretical Framework

According to Khoramabadi et al. (2015), to provide successful health interventions, it is essential to design and implement effective health education programs. Successful health education also depends on the proper use of theo-

ries and models. The aim of this study was to assess the effects of health education intervention using health talk; demonstration of history taking, blood pressure, and weight measurement; and role-play on attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS. Theories that provided the conceptual framework for the study were two intrapersonal capacity theories: the Rational Model and the Health Belief Model. Theories on intrapersonal capacity deal with and try to change characteristics at the individual's capacity level by improving awareness and knowledge, beliefs, opinions and attitudes, self-efficacy, intentions, and skills and personal power (WHO EMRO, 2012). A teaching guide prepared by the researcher based on the principles of the Rational Model and the Health Belief Model was used for the health education intervention performed once for the intervention group during a 2-hr session (using health talk, demonstration, and role-play). Women in the control group received routine care and did not receive training on the models (Khoramabadi et al., 2015).

The Rational Model also known as the knowledge, attitudes, practices model is based on the understanding that increasing a person's knowledge will prompt a behavior change. In this case, the change in behavior sought is the attendance and utilization of health facilities in Eleme, Rivers State for ANC, FP, and PMTCT by women of reproductive age in the communities. Education strategies within this model target individuals and groups and seek to instill positive and prevent negative health behavior choices. This is achieved by presenting relatively unbiased information (WHO EMRO, 2012). The Health Belief Model illustrates the relationship between beliefs and health, and it is based on the hypothesis that preventive health behavior consists of personal beliefs (Khoramabadi et al., 2015). The Health Belief Model explains human health decision making and subsequent behavior based on six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy, which help predict whether people will take action to prevent, screen for, and control illness (Rimer & Glanz, 2005). Through the health education interventions, the women were educated on ANC, FP, and PMTCT of HIV and AIDS to encourage them to seek the SMI services offered in the health facilities.

The Rational and Health Belief models were employed in the study because the researcher used health education methodologies such as health talk; demonstration of history taking, blood pressure, and weight measurement; and role-play exercises to provide information about safe motherhood strategies of ANC, FP, and PMTCT and to assess if the health education intervention would have an effect on the attitudes of women of reproductive age toward SMI components in Eleme, Rivers State, Nigeria. Also, the intervention provided relevant information on the importance of ANC, FP, and PMTCT and the key roles they play in preventing and reducing maternal and infant morbid-

ity and mortality arising from pregnancy, its complications, and related issues. Data were collected using a self-designed, structured effect of health education questionnaire covering the three components of safe motherhood under study, namely, ANC, FP, and prevention of mother-to-child transmission of HIV and AIDS (PMTCT; including demographic characteristics) based on the Rational Model and the Health Belief Model. To evaluate the intervention, the researcher administered the questionnaire before and immediately after completion of the intervention, and participants in both groups fill out the questionnaire. Data were analyzed using SPSS software and reported in tables.

Similarly, Khoramabadi et al. (2015) studied the effects of education based on the Health Belief Model on dietary behaviors of Iranian pregnant women. The aim of the study was to assess the effects of training on the Health Belief Model on dietary behaviors of a sample of pregnant Iranian women. The study was a randomized controlled clinical trial involving 130 pregnant women who attended two health care centers at the Shahid Beheshti University of Medical Sciences. Data were collected using a structured questionnaire in three parts and seven subscales (including demographic characteristics, knowledge, and dietary behaviors) based on the Health Belief Model. Principles of education were based on the Health Belief Model and performed twice during 2-hr sessions in the intervention group. Women in the control group received routine care and did not receive training on the model.

These results demonstrated significant differences between the two groups in terms of mean scores of knowledge, perceived severity, perceived barriers, performance guide, and individual performance, and the means of these variables in the intervention group were also higher than the means of the control group. On the other hand, after the intervention, no statistically significant difference was found in the mean scores of perceived benefits and perceived susceptibility between the groups (two independent samples t test, $p < 0.001$). Khoramabadi et al. (2015) concluded that educational interventions based on health promotion patterns can be effective in enhancing awareness, improving understanding of risks, and reducing barriers to healthy behavior, ultimately improving women's health and nutritional performance during pregnancy.

Concept of Health Education Intervention

Health education is defined by the Joint Committee on Health Education and Promotion Terminology (as cited in WHO EMRO, 2012) "as any combination of planned learning experiences based on sound theories that provide individuals, groups, and communities the opportunity to acquire information and the skills needed to make quality health decisions." The WHO (1998) defines health education as comprising "consciously constructed opportunities for learning involving some form of communication designed to improve *health literacy,* including improving knowledge, and developing *life skills* which are conducive to individual and *community health*" (p. 4).

According to WHO EMRO (2012), health education forms an important part of health promotion activities. These activities occur in schools, workplaces, clinics, and communities and include topics such as healthy eating, physical activity, tobacco use prevention, mental health, HIV/AIDS prevention, and safety. Health education is focused on building individuals' capacities through educational, motivational, skill-building, and consciousness-raising techniques. Evidence-based health education interventions are most likely to be based on theory and have been shown through empirical study to be effective. According to Rimer, Glanz, and Rasband (as cited in WHO EMRO, 2012), the use of theory-based interventions evaluated through appropriate designs contributes to the understanding of why interventions do or do not "work" under particular conditions. Rosenberg and Donald, Jenicek, and Cottrell and McKenzie (as cited in WHO EMRO, 2012) noted that based on the definitions of evidence-based medicine, evidence-based public health, and the work of Rimer et al. (2001), evidence-based health education practice is the process of systematically finding, appraising, and using qualitative and quantitative research findings as the basis for decisions in the practice of health education.

Methods in Health Education

According to the National Open University of Nigeria (NOUN, 2013) in its *Health Education, Advocacy, and Community Mobilization* module, teaching methods in health education refers to ways through which health messages are used to help solve problems related to health behaviors. Teaching materials or aids are used to help and support the communication process to bring about desired health changes in the audience. Health educators in health education work use a variety of teaching methods. These methods are adapted to different situations so that health education messages can be communicated most effectively. The NOUN (2013) discusses these teaching methods as presented next.

Health talks. The best way of communicating health messages in certain situations is by using health talks. Talking is often the most natural way of communicating with people to share health knowledge and facts. In health education, there will always be many opportunities to talk with people. Group size is important: The number of people to engage in a health talk depends on the group size. However, talks are most effective if conducted with small gatherings (5–10 people) because the larger the group, the less chance that each person has to participate. If the group is too big, it is difficult to get the health message across. Talking to a person who has come for help is much like giving advice. But advice is not the same as health education. To make a talk educational rather than just a chat, health educators can combine it with other methods, especially visual aids such as posters or audiovisual material. Also, health educators can tie a talk into the local setting by using proverbs and local stories that carry a positive health message.

Demonstration. Health educators often find themselves giving a demonstration in the course of performing their duties. This form of health education is based on learning through observation. There is a difference between knowing how to do something and actually being able to do it. The aim of a demonstration is to help learners become able to do the skills themselves, not just know how to do them. The health educator needs to make the demonstration relevant to the local situation and find ways to make health-related demonstrations a pleasant way of sharing skills and knowledge. Although demonstration sessions usually focus on practice, they also involve theoretical teaching as well—showing how is better than telling how. "If I hear, I forget. If I see, I remember. If I do, I know" (Chinese proverb). Note that people remember 20% of what they hear, people remember 50% of what they hear and see, and people remember 90% of what they hear, see, and do—with repetition, close to 100% is remembered.

Role-play. In role-play, some of the participants take the roles of other people and act accordingly. Role-play is usually a spontaneous or unrehearsed acting out of real-life situations during which others watch and learn by seeing and discussing how people might behave in certain situations. Learning takes place through active experience; it is not passive. Role-play uses situations that the members of the group are likely to find themselves in during their lives. Health educators should use role-playing because it shows real situations. It is a direct way of learning; participants are given a role or character and have to think and speak immediately without detailed planning because there is usually no script. In a role-playing situation, people volunteer to play the parts in a natural way and other people watch carefully and offer suggestions to the players. Some of the people watching would decide to join in with the play.

The purpose of role-play is to act out real-life situations so people can better understand their problems and the behavior associated with the problem. For example, they can explore ways of improving relationships with other people and gain the support of others as well. They can develop empathy, or sympathy, with the points of view of other people. Role-play can give people experiences in communication, planning, and decision making. For example, it could provide the opportunity to practice a particular activity such as coping with a difficult home situation. Using this method would help people to reevaluate their values and attitudes. Role-play is usually undertaken in small groups of four to six people (NOUN, 2013).

Concept of Safe Motherhood

Safe motherhood means that women are safe and healthy during pregnancy and delivery ("Human Rights Matrix," 2013). Safe motherhood is made up of initiatives, practices, protocols, and service delivery guidelines that are organized to provide high-quality obstetric and gynecological services to women

and their babies throughout the duration of pregnancy and afterwards. Such services include FP, prenatal, delivery, and postpartum care to ensure that the highest level of health for the mother, fetus, and infant in the antepartum, intrapartum, and postpartum periods is maintained ("Human Rights Matrix," 2013).

Conceptually, safe motherhood is a component of reproductive health that deals with prenatal care, safe delivery by a skilled attendant, essential obstetric care, postnatal and neonatal care, postnatal care and breast-feeding (Federal Ministry of Health, 2013). Safe motherhood can be achieved by providing high-quality maternal health services to all women. Services to help make motherhood safe include care by skilled health personnel before, during, and after childbirth; emergency care for life-threatening obstetric complications; services to prevent and manage the complications of unsafe abortion; FP to enable women to plan their pregnancies and prevent complications related to too many, too close, too early, and too late pregnancies; health education and services for adolescents; and community education for women, their families, and decision makers (Fitaw et al., 2005).

Safe Motherhood Initiative

Maternal health is one of the key recognized elements of attaining development goals. It is clearly a key development issue worldwide (Achen, 2011). The health status of women gained increased awareness in the late 1970s when the United Nations proclaimed the period between 1976 to 1985 as the international Decade of Women. The aim was to improve the quality of life of women. Various Women-in-Development programs were established. Women-in-Health was initiated by WHO in 1980 to promote the participation of women in Primary Health Care in view of the vital role they play in family life (Olise, 2007).

Consequently, to draw attention to the magnitude of maternal mortality globally and to mobilize resources at national and international levels to prevent maternal deaths, in 1987 the World Bank, WHO, and UNFPA convened an international conference on Safe Motherhood in Nairobi, Kenya. Two years later, that is, in 1989 (also in Nairobi), the Safe Motherhood Initiative was formally launched (Olise, 2007). The launch of the SMI was seen as a major milestone in the race to reduce the burden of maternal mortality throughout the world, particularly in developing countries. It issued a call to action to reduce maternal mortality and morbidity by one half by the year 2000 (Olise, 2007).

The SMI represents a worldwide effort that aims to increase attention to and reduce the devastating numbers of women who suffer death or serious illness every year; making motherhood safe for the world's women calls for national governments, funding agencies, and nongovernmental organizations to make maternal health an urgent health priority and to ensure that the neces-

sary political and financial support is dedicated to this effort. It also gave birth to the Inter-Agency Group (IAG) for Safe Motherhood. All events that make pregnancy unsafe, irrespective of the gestation or outcome, are part and parcel of safe motherhood (SMI, 2011).

Subsequent work on the SMI by the Inter-Agency Group and others has outlined clear strategies and specified interventions for the reduction of maternal morbidity and mortality, often referred to as the Pillars of Safe Motherhood. For reductions in life-threatening risks and mortality, good-quality maternal health services by trained health workers must be available and must be used (SMI, 2011). Safe motherhood programs emphasize addressing all of these issues as well as other reproductive health issues, such as sexually transmitted infections, unplanned pregnancy, obstetric fistula, and female genital cutting (World Bank Group, 2012). Also, safe motherhood investments are cost effective.

As Olise (2007) noted, safe motherhood depends on three key elements. The first is the improvement of the standard of living of the people to ensure that everyone, including women and children, are in good health. Second, there must be good health care delivery system, including ANC, at various levels. The third factor is a functional referral system to ensure that cases that cannot be handled effectively at lower levels are transferred to higher levels of health care delivery for appropriate treatment; many countries have established a national SMI.

May 8 of every year is International Safe Motherhood Day. Strategies for achieving United Nations–set objectives include antenatal (prenatal) care, tetanus immunization of women of reproductive age, emergency care for pregnant women, and safe blood transfusion services, as well as safe delivery, education of the girl child, FP, and adequate nutrition (Olise, 2007). Furthermore, the United Nations Population Fund (UNFPA, 2012) stated that working for the survival of mothers is a human rights imperative. It also has enormous socioeconomic ramifications and is a crucial international development priority. Components of SMI on which data were collected are discussed in the following sections.

Antenatal Care

Olise (2007) referred to ANC as the professional service given to pregnant women to promote and maintain the good health of the expectant woman and the unborn child until the safe delivery of a mature and healthy baby. Focused ANC refers to a minimum of four antenatal clinic visits, each of which specifies items of client assessment, education, and care to ensure the prevention of or early detection and prompt management of complications (Federal Ministry of Health, 2012). In the developed world, 97% of women receive prenatal care. This contrasts sharply with the experience in many developing countries where

less than 30% of the women receive ANC. A good number of those who receive ANC in rural areas even prefer to deliver at home attended to by traditional birth attendants or relatives who are well versed in local traditional practices and customs, but not necessarily safe health practices (Olise, 2007).

Family Planning

FP, also known as child birth spacing, simply refers to a decision made by couples and individuals on when to get pregnant, the number of children to have, and the intervals at which to have them to be able to cater to the family's needs (Society for Family Health Nigeria, 2012). It also assists infertile couples with investigation and treatment. FP is one of the strategies or practices used in safe motherhood to prevent unwanted and at-risk pregnancies that would result in maternal and infant morbidity and mortality. As the saying goes, "prevention is better than cure."

The rationales for FP are as follows:

1. *health rationale*: reduction of risky pregnancies, prevention of abortion;
2. *socioeconomic rationale:* enough shelter, food, employment;
3. *human right*: provides opportunity for couples to decide the no and timing of childbirth, improves status of women in society; and
4. *demographic rationale* (not used in the Nigerian setting): regulates population growth for better national planning and development (SHF, 2012).

Prevention of mother-to-child transmission of HIV and AIDS. PMTCT stands for prevention of mother-to-child transmission of HIV. It involves all the measures or interventions carried out to reduce the risk of HIV transmission from an infected mother to her baby during pregnancy, labor, delivery, and breast-feeding. According to Zambia AED/LINKAGES PMTCT Programme (2009), factors that contribute to mother-to-child transmission of HIV include the following:

- ***Viral load.*** A high HIV viral load in the mother's blood increases the chances of a baby being infected with HIV. Also, chances of a baby getting infected increase when the mother has an advanced infection or full-blown AIDS and gets a new infection during pregnancy or breast-feeding.
- ***Maternal factors.*** The chances of mother-to-child transmission of HIV increase when a mother has low immunity (low CD4 count), a poor nutritional status, breast conditions (e.g., cracked nipples or mastitis), an untreated sexually transmitted infection (STI), and no antiretroviral (ARV) treatment during and after delivery.

- ***Obstetrical factors.*** Chances of mother-to-child transmission of HIV increase with the following: multiple vaginal examinations; premature rupture of the membranes; prolonged labor, which could lead to interventions that would increase chances of HIV infection; intrapartum hemorrhage; episiotomy; and milking the cord during delivery.
- ***Foetal factors.*** Chances of a baby being infected with HIV increase when the baby is born prematurely and the mother has a multiple pregnancy.
- ***Other factors.*** Other factors that contribute to babies getting infected through (MTCT) include the following: mixed feeding, unnecessary suction of the baby during delivery, duration of breast-feeding, and breast-feeding from an infected mother while the baby has lesion or thrush in the mouth. A mother having multiple sexual partners; inconsistent use of condoms; gender inequality, which makes it difficult for women to negotiate safer sex; and adverse cultural practices (e.g., sexual cleansing of widows) are also inclusive.

WHO's four-pronged approach forms the basis of PMTCT of HIV. The four prongs are prevention of HIV infection, particularly in women, young people, and parents-to-be; prevention of unintended (unwanted) pregnancies; prevention of HIV transmission from HIV-infected women to their children (MTCT); and provision of care and support to affected families and individuals (Zambia AED/LINKAGES PMTCT Programme, 2009).

Concept of Maternal Mortality

The WHO defines maternal death mortality as

> the death of woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidents, or incidental causes. (WHO, 1977, pp. 763–764)

Thus, a death from complications of induced abortion is a maternal death because it is considered to be due to the "management" of the pregnancy (Maine, 1991). The United States of America Joint Commission on Accreditation of Healthcare Organizations calls maternal mortality (death) "a sentinel event" and uses it to assess the quality of a health care system. Maternal mortality data are said to be important indicators of overall health system quality because pregnant women survive in health facilities in good sanitary condition that are safe, well staffed, and equipped and that provide them with essential drugs. If new mothers are thriving, it indicates that the health care system is doing its job. If not, problems likely exist (Garrett, 2007).

The WHO definition of maternal mortality is one of several and raises some controversial issues that need to be recognized and addressed, especially deaths from accidents or incidental causes because they are not classified as maternal death even when they occur during pregnancy, for instance, deaths resulting from gender-based violence when a woman is pregnant. As a result, other definitions of maternal mortality include deaths resulting from accidental and incidental causes; for example, incidental causes include deaths secondary to violence against women related to the pregnancy and deaths in relation to the socioeconomic and cultural environment ("Maternal Health," 2013). Also, it has been reported that about 10% of maternal deaths occur late, that is, after 42 days following a termination of pregnancy or delivery (Koonin, Atrash, Rochat, & Smith, 2013), and thus, some definitions extend the time of observation to 1 year after the end of gestation. However, the WHO definition is the most widely quoted and recognized.

The WHO (1986) puts the worldwide maternal deaths every year at 500,000, adding that this is almost one every minute. The WHO (2012) also stated that maternal mortality is unacceptably high, especially in developing countries. About 800 women die from pregnancy or childbirth-related complications around the world every day. In 2010, 287,000 women died during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented. According to Maine (1991), whose works on maternal mortality form some of the early studies on the subject matter, the majority of these deaths are in developing countries. As the figures above show, 25% of women of reproductive age live in developed countries, but only 1% of all maternal deaths take place in those countries (Starrs, 1987). Even among the developing regions of the world, however, there is substantial variation. Because of low fertility and maternal mortality in China, East Asia has much less than its share of maternal deaths in contrast to Africa, which has a lot more than its fair share (Lingmei & Hui, 1988).

Method

Research Design

The pretest, posttest, control group quasi-experimental research design (Nwankwo, 2013) was used in this study to investigate the effects of health education intervention on the attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS in Eleme, Rivers State, Nigeria. It was considered appropriate for this study because the researcher sought to test the effects of health education intervention on the attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS in Eleme, Rivers State, Nigeria. The design used was parallel, un-blinded (it was impossible for participants to be blinded to the intervention

because they had to actively participate in the health education intervention) and consisted of two blocks, intervention and control groups.

Table 1
Ages and Distribution of Participants in the Intervention and Control Groups

Group	15–24 years	25–34 years	35–44 years	45 years & above	Total (*N*)
Intervention Group	41	87	67	5	200
Control Group	51	87	53	9	200
Total	92	174	120	14	400

Note. Participants in the intervention and control groups were 200 each, totaling 400 participants.

Population for the Study

This study took place in Eleme LGA of Rivers State, for about 6 weeks between April and May 2014. A population of 1,082 women of reproductive age was used for this study. This figure included estimates of the total average monthly attendance of all women of reproductive age, for the months of January, February, and March 2014, at the three state-government-owned health Model Primary Health Centers (MPHCs) in Ebubu, Eteo, and Onne in Eleme LGA of Rivers State. The estimates were derived from the records of the ANC, FP, and infant welfare clinics. The weight records of babies weighed at the infant welfare clinic were used as a guide to estimate the number of women of reproductive age at the infant welfare clinic, because each child was accompanied by his or her mother, and data obtained were as follows: Model Primary Health Center (MPHC) Ebubu (496, 510, and 510); MPHC Eteo (464, 426, and 437); MPHC Onne (127, 149, and 128); total (1,087; 1,085; and 1,075), respectively, and grand total (3,247) for January, February, and March, respectively (MPHC Ebubu, 2014; MPHCr Eteo, 2014; MPHC Onne, 2014;).

The participants for this study were women (newly enlisted for the study) of reproductive age (15–49 years), pregnant or not, who attended the antenatal, FP, and infant welfare clinics at three of the six state-government-owned health centers in Eleme LGA of Rivers State in the months of April and May. The health centers included MPHCs Ebubu, Eteo, and Onne. The eligibility criteria for enrollment were as follows: (1) women of reproductive age, (2) pregnant or not but must be healthy, (3) attended the antenatal, FP, and infant welfare clinics at MPHCs Ebubu, Eteo, and Onne. The exclusion criteria included (1) women outside the reproductive age group, (2) unhealthy whether pregnant or not, (3) did not attend antenatal, FP, and infant welfare clinics at MPHCs

Ebubu, Eteo, and Onne. Average monthly attendance was calculated as mean of the 3 months at 1,082.33 participants.

Sample and Sampling Techniques

The sample size for this study was 400 women of reproductive age. The figure was derived using Taro Yamen formula. Purposive sampling (with respect to geographical location), quota sampling, and simple random sampling techniques were used to select the participants used for the study. Consent was first obtained from each woman confirming her willingness to participate. Participating women in the antenatal, FP, and infant welfare clinics of the three health centers used for the study were randomly assigned to either intervention group or control group.

Instrument for Data Collection

A self-designed, structured and validated Impact of Health Education Intervention on Knowledge, Attitude, and Practice of Safe Motherhood Questionnaire was used to collect data for this study. It comprised two sections, A and B, for which Section A was about demographics such as gender, age, parity, and educational qualifications and Section B dealt with the items used to elicit information on the variables being studied. Section B tested attitude toward SMI components using multiple-choice questions on a modified 4-point Likert scale of *strongly agree, agree, disagree,* and *strongly disagree.* The questionnaire was administered twice as pre- and posttest. Summated rating for the modified 4-point Likert scale was *strongly agree* = 4 points, *agree* = 3 points, *disagree* = 2 points, and *strongly disagree* = 1 point. An example of a questionnaire statement in Section B to which participants responded is "every mother should attend antenatal clinic and receive antenatal care when pregnant," and responses were weighted on a 4-point modified Likert scale. The composite score for each participant on all the items was computed. The lowest score obtained from the responses in the section was 1 and the highest 4.

Validity of the Instrument

To ensure the face and content validity of the questionnaire, the researcher gave a draft of the questionnaire to her supervisor and two other lecturers of the Department of Human Kinetics and Human Education, University of Port Harcourt, Rivers State, Nigeria. This was after a panel of lecturers from the department had validated the instrument at a research proposal held in the department to consider the adequacy and appropriateness of the study. To ensure the effectiveness of the exercise, the researcher provided the lecturers with clear guidelines on what to do, in a letter that accompanied the questionnaire. The purpose of the study, research questions, and hypotheses of the study were

included in the guidelines. These helped the lecturers to determine which items elicited the information they were intended to elicit. In addition to this, specific instructions were given to the lecturers to review, where necessary, all the questionnaire items in terms of their clarity and the appropriateness of the language and expression to the respondents, including the appropriateness of the instruction to the respondents.

At the end of the questionnaire, space was provided for any comments the lecturers wished to make regarding the overall adequacy of the instrument. Thereafter, the items were modified along the lines suggested by lecturers' comments. See Appendix for the guidelines given to the lecturers.

Reliability of the Instrument

The Model Primary Health Center, Agbonchia, Eleme with similar characteristics as the other health centers was used to test the reliability of the research instrument. This group was not used in the final study. Information received from the responses was also used to modify the questionnaire items and to improve the reliability of the research instrument. The reliability test also acquainted the researcher on what problems would likely be encountered during the distribution and collection of data from the participants. Reliability for internal consistency of the instrument was done using the split-half method. For this purpose, 40 participants were selected using simple random sampling technique from the Model Primary Health Center, Agbonchia, Eleme LGA of Rivers State. Forty copies of the questionnaire were served there. These were retrieved, after being filled out by the women. The 40 questionnaires retrieved were split into equal halves of odd and even numbers. These were coded and first correlated using the Pearson product–moment correlation coefficient. Then the reliability on full test was done using Spearman–Brown formula: $rf = 2 * \text{Reliability on Half Test} / 1 + \text{Reliability on Half Test}$. The reliability coefficient value obtained for the variable attitude was $r = 0.79$. It was high enough to guarantee the use of the instrument for the study.

Data Collection

The researcher was granted ethical approval to embark on the study by the Medical Officer Health (MOH), in charge of all the health centers in Eleme LGA of Rivers State and the ethical committee. The researcher administered the questionnaires directly to the participants (mainly newly enlisted women of reproductive age for the study) through personal contacts. The researcher was assisted on this by training and using the services of six research assistants and community health officers in each health facility to ensure that the questionnaires were properly served, filled out, and retrieved. Instructions pertaining to filling out the questionnaires were thoroughly explained to the par-

ticipants. The questionnaires were administered and retrieved after being filled in by the participants. Any uneducated woman was assisted in filling out the questionnaires by the researcher, research assistants, and community health officers.

The participants were served the questionnaires twice, first as a pretest and second as a posttest immediately after receiving a teaching session of the health education intervention for the intervention group and immediately after the usual clinic routine care for the control group, during their visits to the ANC, FP, and infant welfare clinics at three of the six state-owned government health centers in Eleme, Rivers State, for 6 weeks in April and May 2014. The control group did not participate in the planned health education intervention given by the researcher, research assistants, and the community health officers.

The participants in the control group had the routine health talk given to them on their visit to the clinic; they and their counterparts in the intervention group were treated to light refreshments and were given souvenirs of safe motherhood caps, handkerchief, pens, and drinking cups designed by the researcher. Also, they were given free diapers, toys, and drinking cups for their babies. The procedures for the study, that is, first pretest and the health education intervention for the intervention group and the usual clinic routine for the control group and second the posttest, were explained to each participant including information about confidentiality. Those who accepted to participate had an opportunity to consider the information, ask questions, and have these answered satisfactorily. They were also informed that participation is voluntary and that they were free to withdraw at any time without giving any reason.

Each health education intervention including health talk (teaching mothers on meaning, importance, and care received at ANC, FP, and PMTCT clinics), demonstration (displaying and explaining the care women receive in the ANC, FP, and PMTCT clinics such as history taking, blood pressure, and weight measurement, how to use male and female condoms), and role-play (short drama depicting the availability of health officers, free ANC, FP, and PMTCT services at the health facilities) lasted for 2 hr, and it covered relevant areas such as meaning, importance, and benefits of the three components of safe motherhood under study, namely, ANC, FP, and PMTCT of HIV and AIDS.

Table 2
Brief Description of Health Talk, Demonstration, and Role-Play

Intervention component	Description
Health Talk	45 min for introductory lecture by health educator on meaning, importance, and care received at ANC, FP, and PMTCT clinics.

Demonstration	30-min presentation on skill training that involves displaying and explaining the care that mothers receive such as history taking, blood pressure, and weight measurement, how to use male and female condoms at the ANC, FP, and PMTCT clinics.
Role-Play	25-min skill training exercise involving participants using a short drama depicting the availability of health officers, free ANC, FP, and PMTCT services at the health facilities.
Summary	20 min for recap, questions, and answers between health educator and participants.

Note. Table depicts time and areas covered on each SMI component.

A self-designed, comprehensive, quick reference teaching guide based on the Rational Model and the Health Belief Model was provided to facilitate training of the research assistants for understanding of the subject matter, uniformity of ideas, and information given to the participants in the intervention group. It also served as a guide while giving the health talk for coverage of topics and effective time management. Forty-five minutes was allotted to the components in the health education intervention session. A total of 800 questionnaires were served to the 400 participants as pre- and posttest to the intervention and control groups, respectively. All of the 800 questionnaires served were fully completed and returned for all the groups. The pretest questionnaires were filled out and returned at the start of the clinic for each group, and the posttest questionnaires were filled out immediately after the health education intervention and the clinic routine for the intervention and control groups, respectively.

Data Analysis

Data for this study were collated, coded, and analyzed using SPSS (17). They were analyzed to address research questions and hypotheses. The research questions were answered using mean and standard deviations. The responses to items were weighted, and a criterion mean was set at 2.5 for taking decision on attitudes of the women. An ANCOVA test was used to answer the hypotheses at 0.05 level of significance. An ANCOVA test was used to determine possible changes in attitude, and significance was established when $p < 0.05$.

Results

Table 3 shows that the women in the intervention group had higher attitudinal gain in FP (M = 1.2350); this was followed by their gain in ANC (M = .6250), and the least was had in terms of PMTCT (M = .2775). The women in the control group had their highest attitudinal gain in terms of FP (M = 1.0775); this was followed by their gain in ANC (M = .4150), and the least gain was found PMTCT (M = 1.35). The overall SMI mean gain score of women in

the intervention group was .7118, representing 31.78% mean gain difference, and that of their control counterparts was .5082, representing 23.25% mean gain difference. Table 4 reveals that participants in the experimental group in the age bracket of 35–44 years had the highest gain in attitude (M = .7657), and those in the control group in the age bracket of 35–44 years had the highest attitudinal gain (M = .5483).

The results of the ANCOVA on difference in attitude of women of reproductive age toward safe motherhood are are shown in Table 3 and indicate that the health education intervention had a statistically significant effect on attitudes of women of reproductive age toward the safe motherhood components of ANC, FP, and PMTCT in Eleme, Rivers State, F1 (397 = 70.077, p = .000, p < .05), partial eta-squared statistics, R^2 = .150 (adjusted R^2 = .146). Results pertaining to the ANCOVA on difference in attitude toward safe motherhood among women of reproductive age based on age group are depicted in Table 4. No significant differences were observed between the age groups regarding attitudes toward SMI as a result of the health education intervention, F3 (394 = .079, p = .971, p > .05), partial eta-squared statistics = R^2 = .151 (Adjusted R^2 = .140).

Table 3

Pre- and Posttests Grand Mean/Mean Gain Scores on Attitudes of Women of Reproductive Age Between Groups Toward SMI Components in Eleme, Rivers State, Nigeria

			Pretest		**Posttest**		***M***	
Group	**Variable**	***N***	**Grand mean**	***SD***	**Grand mean**	***SD***	**Gain diff.**	**% gain**
Intervention	ANC	200	2.1835	.54461	2.8086	.53108	.6250	28.63
	FP	200	2.1300	.64823	3.3650	.60714	1.2350	57.98
	PMTCT	200	2.4050	.50161	2.6825	.45647	.2775	11.54
	Overall	200	2.2396	.45776	2.9514	.31684		
	SM						.7118	31.78
Control	ANC	2.1153	.45098	2.5303	.49698	.4150	19.62	28.63
	FP	2.0425	.49818	3.1200	.68222	1.0775	52.75	57.98
	PMTCT	2.3988	.49119	2.4313	.44969	.0325	1.35	11.54
	Overall	200	2.1857	.38147	2.6938	.29759		
	SM						.5082	23.25

Table 4

Grand Mean Scores on Effect of Health Education Intervention on Attitudes of Women of Reproductive Age Toward SMI Components Between Age Groups in Eleme, Rivers State, Nigeria

			Attitude	
Group	**Age (years)**	***N***	**Grand mean**	***SD***
Intervention	15–24	41	.6317	.59134
	25–34	87	.7113	.54220
	35–44	67	.7657	.54484
	45+	5	.6540	.65744
Control	15–24	51	.4904	.53477
	25–34	87	.4913	.47923
	35–44	53	.5483	.50584
	45+	9	.5356	.39119

Health education interventions are planned learning experiences in which different forms of communication are used to help individuals adopt behaviors to improve, promote, maintain, or restore health. The attitudes of women of reproductive age toward safe motherhood improved significantly as a result of the health education intervention. The intervention group had a higher mean gain than the control group did. They performed better than their control group counterparts in their scores on attitudes toward safe motherhood components. This occurred after the intervention group was given 2 hr of health talk; demonstration of history taking, blood pressure, and weight measurement, and so forth; and role-play exercises. The control group maintained the usual clinic routine. Likewise, no significant difference was found on the effects of the health talk, demonstration, and role-play on the attitudes of women of reproductive age toward safe motherhood based on age in the intervention and control groups.

Discussion

The health education intervention resulted in the improvement of the intervention group participants' attitudes toward the SMI component of ANC, FP, and PMTCT, with posttest mean scores of 2.8086, 3.3650, 2.6825, and 2.9514, respectively. The posttest mean scores for the control group were 2.5303, 3.1200, 2.4313, and 2.6938 for ANC, FP, and PMTCT, respectively. In addition, the attitudes on overall SMI (i.e., the total score of all the components for each group) posttest mean gain score of .7118 (31.78%) for the intervention group against .5082 (23.25%) for the control group further buttressed that the intervention had an effect on the attitudes of women of reproductive age

toward safe motherhood components of ANC, FP, and PMTCT of HIV and AIDS.

Through the six constructs of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy of the Health Belief Model in the health education intervention in this study, the women were taught that though pregnancy is a physiological state in normal conditions, the physiological processes such as increased nutrient requirement for mother and growing fetus and reduced immunity place the women at risk of diseases such as malaria, anemia, and high blood pressure (perceived susceptibility). These conditions could be life threatening if not detected early and treated (perceived severity). For example, the ANC offers the opportunity for early detection and prompt treatment, because use of FP services prevents high risk pregnancy and use of PMTCT services reduces the risk of transmission of HIV to newborn babies (perceived benefits). In effect, the health education intervention, as well as the awareness-creating programs of the Rivers State Government, especially during the maternal and child health week celebrated every year by the community health officers, has integrated SMI components of ANC, FP, and PMTCT into the social and cultural consciousness of the women in Eleme, Rivers State, Nigeria.

This is consistent with the findings of Nwokocha (2006), who noted that evidence of the influence of beliefs and practice on pregnancy outcomes where the activities of individuals are strictly regulated by cultural norms and values has been demonstrated. Nwokocha noted that the findings of the study provide data to affirm links between sociocultural variables and pregnancy outcomes among the Ibani of Rivers State, Nigeria, identifying communal and individual values, attitude, and behaviors related to pregnancy. Nwokocha further asserted that although individuals are ascribed some freedom within the social system, such independence is unwittingly guided by the norms and values of a society.

Similarly, Khoramabadi et al.'s (2015) study on the effects of education based on the Health Belief Model on dietary behaviors of Iranian pregnant women was aimed at assessing the effects of training on the Health Belief Model on dietary behaviors of a sample of pregnant Iranian women. The study was a randomized controlled clinical trial involving 130 pregnant women who attended two health care centers of Shahid Beheshti University of Medical Sciences. Data were collected using a structured questionnaire in three parts and seven subscales (including demographic characteristics, knowledge, and dietary behaviors) based on the Health Belief Model. These results demonstrated that there were significant differences between the two groups in terms of mean scores of knowledge, perceived severity, perceived barriers, performance guide, and individual performance, and the means of these variables for the intervention group were also higher than those for the control group.

Perceived barriers are women's preference to patronize traditional birth at-

tendants (TBAs) or local maternity homes, and cues to action include appointment cards and exchange of phone numbers between the pregnant mother and the health worker. The services are free at the time, and the health centers are located in every ward in the LGA for easy accessibility (self-efficacy). Moore et al.'s (2011) study in Gokana LGA of Rivers State, Nigeria, revealed that factors responsible for nonutilization of a health facility for delivery include long distance to the health facility, 33 (68.7%); onset of labor at night, 40 (83.3%); unavailability of means of transportation, 37 (77.1%); lack of money for transportation, 26 (54.2%); unsatisfactory services at the health facility, 26 (54.2%); unfriendly attitude of staff of the health facility, 34 (70.8%); unavailability of staff at the health facility, 32 (64.0%); lack of urgency at the health facility, 36 (75.0%); and previous uneventful delivery at the health facility, 32 (66.7%). In conclusion, utilization of health care services during delivery in Nigeria is still poor (Moore et al., 2011).

Recommendations

Based upon the findings of this research, the researcher recommends the following:

1. The government of Rivers State should provide functional health education units in all the MPHCs in the LGAs of the state to ensure planned health education activities in the health centers as well as in the communities. The health education activities should cover all aspects of safe motherhood to ensure decrease in maternal morbidity and mortality rates in the state.
2. Government technocrats, administrators, and health managers in Rivers State should be properly oriented on WHO's policy guidelines on health education practice as presented in the current National Policy on Health Promotion of Nigeria.

Conclusion

The health education intervention embarked on in this study centered on the six constructs of the Health Belief Model: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. It used health talk, demonstration of history taking, blood pressure, and weight measurement, and so forth; and role-play exercises to present relatively unbiased information (Rational Model) to the women. Results from this study showed that planned health education intervention based on theories and models using different forms of communication has an effect on the attitudes of women of reproductive age toward SMI components of ANC, FP, and PMTCT of HIV and AIDS regardless of age in Eleme, Rivers State, Nigeria. Health education's prerogative is to improve the health of the individual through appropriate teaching and learning experiences. The individual's

knowledge of related health issues and acquisition of skills needed to behave in health-promoting ways is increased, and thus, the individual is motivated to behave in ways that promote and restore health. The effectiveness of health education is increased when people are taught to take personal actions to address discrete and immediate health or behavioral problem of importance to them (WHO, 2012).

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APPENDIX A

Instrument Validation Evaluation Guide

Dear Expert,

You have been selected to assist me in validating the attached instruments because of your knowledge in medical/educational research of this nature. Could you please review the instruments and answer the questions that follow. Please feel free to make corrections, additions, or deletions as you deem fit.

Thank you for your assistance.

1. Are questions on each of the instruments representative of all the contents related to the specific construct being studied?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

2. Are there items that would be difficult to respond to or understand by the women of reproductive age?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

3. Are there questions, words, or phrases that you think should be deleted or modified?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

4. Are there questions that should be included in this instrument?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

5. Are the instructions (directions) provided in this questionnaire clear and easy to understand?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

6. Does the title clearly reflect the content of the instrument?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

7. Does the introductory statement clearly state the purpose of the study?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

8. Are items in the personal data section appropriate?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

9. Is the length of the instrument appropriate for the intended purpose?
   Yes ☐ No ☐ Not Decided ☐
   Comment:_____
   _____
   _____

Please feel free to comment on the questions or areas not covered by the questions above.

_____
_____
_____

Name of Validator: _____

Department: _____

Signature: _____

Date: _____

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Review of Graduate Global Health Certificate Programs in the United States

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Abstract

This report reviewed and analyzed current available graduate level global health certificate programs throughout the United States and provides implications for building a stronger global health paradigm. These programs were identified by using a Web-based search and by reviewing the Council on Education for Public Health (CEPH) Web page. The graduate global health certificate programs were then categorized based on if they were distance learning or campus based, open to all disciplines, and made available to students outside the current university. Information found from the Web-based search was validated by contacting the listed contact person from the identified schools by phone or e-mail. Thirty graduate level global health certificate programs were identified through the Web-based search, but only 26 could be validated. This investigation reveals that only a few programs offer online graduate level global health certificate programs open to all students regardless of their discipline and backgrounds.

Keywords

global health; certificate; academic programs; public health; competency; curriculum; education

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There is a growing interest in global health worldwide, especially as the world becomes more interconnected, national boundaries become blurred, and countries share common health problems (Kickbusch & Ivanova, 2013). A similar trend has been observed in the United States, where there is an increase in the demand for global health education programs (Crump, Sugarman, & Working Group on Ethics Guidelines for Global Health Training, 2010; Drain et al., 2007; Macfarlane, Jacobs, & Kaaya, 2008; Shah & Wu, 2008). This demand, expectedly, will continue to rise, especially as globalization facilitates distance learning and increases the number of international students seeking high quality online education (Altbach, 2002; Kerry et al., 2011). Although formal face-to-face learning has its merit, globalization and internationalization of online education is also critical to the diffusion of knowledge and sustainable innovations on a large scale, including global health (Bliuc, Ellis, Goodyear, & Piggott, 2011; Livingstone, 2012; Merson, 2014; UNESCO, 2002).

According to the Consortium of Universities for Global Health (CUGH), global health is "an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide" (Koplan et al., 2009, p. 1995). Global health as a field of study is inter/multidisciplinary and collaborative in its approach and should be open to all students interested in the field. In short, an effective global health system integrates other disciplines into conventional medicine. Fried et al. (2010) pointed out, "Many health problems have a linked aetiology and a common impact, and that innovative solutions can come from all sectors, collaborative relationships become, at a minimum, bidirectional—and optimally, multilateral" (p. 536).

Developing and preparing future leaders for a successful career in the complex field of global health is a major responsibility of academic institutions (Drain et al., 2007; Fried et al., 2010). Many academic institutions in the United States now have a global health curriculum, especially medical and public health schools, but it is unclear how many of them offer distance learning course delivery or are open to all disciplines and students outside of the current student body. The goals of this study are to assess the course delivery of current graduate global health certificate programs in the United States and assess whether these certificate programs are open to all disciplines and students outside of the current study body.

Method

U.S.-based graduate level global health certificate programs were identified by using the Google search engine between May and August 2015. The following keywords were utilized for this search: *certificate global health programs, global health online certificate, global health certification programs, graduate global health certificate program,* and *graduate certificate in global health.* Once the search results appeared, we reviewed the first 30 search page results. In ad-

dition, Council on Education for Public Health (CEPH)–accredited program Web pages were reviewed to identify those that offered a graduate global health certificate. The graduate level global health certificate programs identified were then categorized as distance learning or campus based, open to current students or students outside of the current study body, and open to specific disciplines or open to all disciplines.

A validation process was also conducted in September 2015 to verify the currency of the information obtained. A Web-based search was first conducted to verify the original list of schools listing graduate global health certificate programs. The next step was to contact the listed certificate program contact person from the schools using the official phone number and e-mail address from their Web page. With all phone calls and e-mail inquiries, a brief introduction was given and the following three questions were asked: (1) Is your global health certificate online? (2) Is your global health certificate program open to students outside of the current student body in your university? (3) Is your global health certificate program open to all disciplines? Key program contacts from the universities were given an option to participate in the study and reassured that their identity would be kept anonymous if they chose to participate. Their answers were recorded along with the name of the contact, how many attempts were made to reach them, and the dates and times of the attempts. All phone calls were made during normal business hours and according to the time zone of the universities. A specific message was left when transferred to voicemail and a maximum of three follow-up calls were made on the following normal business hour of the university if no response was obtained from the key contact personnel for the certificate program.

Results

Thirty graduate level global health certificate programs were identified from the Web-based search and CEPH-accredited program Web pages. The geographic distribution of these programs is shown in Figure 1. Of these 30 programs, information for 26 programs was validated from the key program contact person of the university through phone inquiries and via e-mail (response rate = 87%). Most of these individuals were reached by telephone. Key findings from the validated graduate global health certificate programs are shown in Table 1. Overall, it was found that 23% (six of 26) of the graduate global health programs were distance learning, 54% (14 of 26) were open to students outside of the current study body, and 81% (21 of 26) were open to all disciplines. However, only five programs were distance learning and open to students outside of the current study body from all disciplines.

Figure 1. Geographic distribution of graduate global health certificate programs in the United States.

Table 1

Summary of Graduate Level Global Health Certificate Programs in the United States Validated

Category	Total number of programs	Open to students outside of the current student body	Open to all disciplines
Distance Learning	6	5	5
Campus-Based	19	8	15
Distance Learning and Campus-Based (Mix)	1	1	1
Total programs	26	14	21

Discussion

Although there is a relatively high number of global health education programs in the United States, this review shows that few offer a distance learning platform. This contrasts with the high number of people (students and professionals) interested in global health and distance learning education in the

United States (Allen & Seamen, 2013; Chase & Evert, 2011; Khan, Pietroni, & Cravioto, 2010; Shea, 2007). The disparity in the demand and supply of distance learning global health programs compares with other courses offered in U.S. higher education institutions. According to the *2013 Changing Course: Ten Years of Tracking Online Education in the United States* annual report, only approximately 3% of higher education institutions have massive open online courses (Allen & Seamen, 2013).

Although not captured in this survey, a variety of reasons are proposed for the disparity in the availability and demand for distance learning education. In a recent survey of 25 U.S. academic institutions of higher learning, the barriers to adopting distance learning education included a higher time required to prepare a distance learning course compared to the campus-based version, among others. Additionally, difficulty in assessing learning outcomes for distance learning compared with on-campus education may contribute to the low adoption rate of online programs. However, the benefits of distance learning education outweigh the risks. For instance, there is a growing body of evidence that shows that distance learning education, in the long run, is more cost effective than traditional instruction. For example, students taking distance learning courses are likely to incur lower transportation expenses (Bacow, Bowen, Guthrie, Lack, & Long, 2012).

Because distance learning courses are generally accessible to a wider student population, the low number of distance learning graduate level global health certificate programs in this study might explain why only about half of the programs are open to external students. Global health issues are transnational. Hence, it is logical that global health education programs be made accessible to the global community, particularly to students from low income countries seeking quality distance learning education and certification in global health or other fields. The collaborative effort of Harvard University and the Massachusetts Institute of Technology to increase global access to distance learning opportunities through the edX project is an example. In its recent survey of course registrants on edX, approximately 21,000 of the registrants on the distance learning platform had IP or mailing addresses from least developed countries (Ho et al., 2014). Relaxing the eligibility criteria for enrollment and distance learning course delivery may also increase the number of students who obtain certification in global health regardless of their field or educational background.

Graduate level global health certificate programs help increase literacy and awareness regarding global health among graduate students and professionals within the community. Sound global health certificate programs and training opportunities provide various benefits including attracting attention to global health disparities, educating a foundation of professionals capable of working in resource-poor settings, strengthening the position of the institu-

tion to recruit the most talented candidates interested in global health experiences, allowing students to learn about health and culture native to their home countries, and appealing to philanthropists or future trainees that contribute to tuition through global health certificate programs (Battat et al., 2010).

Although care was taken to ensure all possible global health programs were identified, primarily relying on a Web-based search was a major limitation of this study. Some graduate global health certificate programs may have been missed if they did not have an established Web page in 2015 or key terms alluding to a Web page with a graduate global health certificate program. Also, although many schools have Web pages, not all schools have a page dedicated for their graduate global health certificate programs. Finally, it is important to note that although most of the findings were validated through the key contact person for the graduate global health certificate programs at each respective school, the information provided regarding the graduate level global health certificate programs only reflects the authors' interpretation of the information provided.

Conclusions

There has been a significant recent growth in global health programs, though not many available in a distance learning format to a wide range of students with various academic backgrounds. A common thread among North American academic global health institutes is teaching and research, addressing disparities in health outcomes and access to health care, and alleviating the disease burdens of populations beyond their national borders. Academic programs have led to the emergence of a new generation of global health leaders, who through their research and education will significantly improve the health of vulnerable populations worldwide. Beyond that, global health programs must become the cradle of multidisciplinary integration in health sciences education and training. Academic institutions have the urgent opportunity to address global health challenges by creating and increasing students' access to distance learning graduate level global health certificate programs that would prepare a global health workforce to face the emerging global health challenges.

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Incorporating an Innovative Health Promoting Model Into Lebanese Public Schools: Impact on Adolescents' Dietary and Physical Activity Practices—Comparison of HPS With Other Public and Private Schools in Lebanon

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Abstract

Background: The Health Promoting School Initiative (HPSI) was launched by the World Health Organization (WHO) in 1995 based on the concept of an interrelationship between education and health. In 2010, WHO supported the Lebanese Ministry of Education and Higher Education (MEHE) and established a network of 10 Health Promoting Schools (HPS). This study was undertaken to address the extent to which the HPS model was able to enhance the health of adolescents and prepare them to respond to evolving health challenges. **Method:** A cross-sectional survey was carried out during the academic year 2011–2012 and involved a comparison between the 10 HPS networks and 10 other public and private schools, with a total of 2,105 students (Grades 6–9). The Youth Risk Behavior Survey (CDC, 2011) and anthropometric measurements were used for data collection. **Results:** Findings revealed that the current school health program (SHP) failed to address issues of concern to adolescents, with prevalence of risk behaviors related to dietary and exercise practices. Neither the HPS nor control schools had a strong impact on students' health behaviors. **Conclusion:** Revision of the health education curriculum is strongly needed to integrate issues concerning healthy nutrition and physical activity. Expected learning outcomes need be designed to match students' age, grade level, and developmental milestones. The HPS network needs reassessment for project outcomes.

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Keywords

health education; health promotion; health promoting school; school health program; health behavior; risk behavior

Schools offer unique settings where children and adolescents of all cultural backgrounds spend several years together. Adolescents are usually subject to pressures from peers with strong influences related to puberty and increasing need for independence and autonomy. Negative influences such as violence, family conflicts, drugs and alcohol, teenage pregnancy, absence of love and affection, and little attention at home or school strongly impact their lives (O' Rourke, 1996). These influences may translate into immediate physical and psychosocial problems or have long-term consequences that affect their chances to lead fulfilling and healthy lives (License, 2004; O' Rourke, 1996). Health Promoting School (HPS) communities participate to ensure that identified health needs are holistically and collaboratively addressed through the comprehensive HPS framework: curriculum, teaching, and learning; school organization, ethos, and environment; and partnerships and services (World Health Organization [WHO], 1995). This framework is intended to move health education and promotion from being a single and detached health activity delivered in classrooms to a setting-based model that focuses on healthier and supportive environments (WHO, 1996).

Health Promoting Schools: The Framework

The HPS framework is intended to provide guidance and support to schools and health authorities, with essential stakeholder partnerships. It recognizes the needs of students, teachers, parents, health care personnel, and the local community to participate actively in shaping and implementing school health promotion programs and policies (WHO, 1995). Within this framework, the students' experience at school is considered crucial in shaping health behaviors during and beyond adolescence (Figure 1).

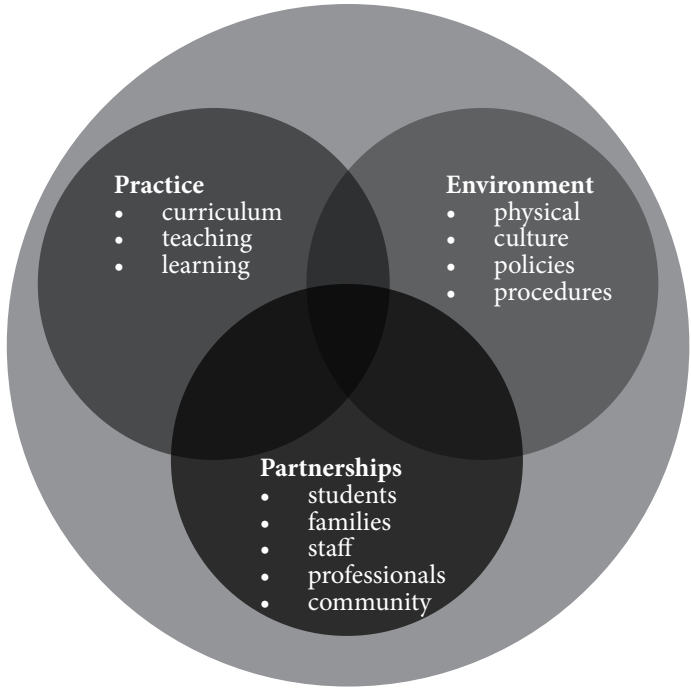

Figure 1. Health Promoting School framework. Adapted from *WHO Expert Committee on Comprehensive School Health Education and Promotion,* by World Health Organization, 1995, Geneva, Switzerland: Author.

Health Promoting Schools in Lebanon: National Experience

School health has been known in Lebanon since April 1920, when an act toward this effect was issued when the country was still under the French colonization. This act mandated that all schools be subject to health inspection, perform physical examinations, and ensure that students receive their recommended vaccinations and have their health records completed. It was not until 1993 that Ministerial Decision Number 1/129 was issued for the foundation of the National Committee for School Medicine.

Lebanon has had a unique experience in school health led by nongovernmental organizations and international agencies that provide services across the country. Their activities include provision of medical screening, provision of healthy meals, and organization of campaigns for oral health and hygiene (WHO, 2005). An important milestone was Act Number 10227/97, on May 8, 1997, which developed the Lebanese Integrated Health Curriculum, from KG to G12. Based on Ministerial Resolution Numbers 71/m/98 and 73/m/98, the

national school health program (SHP) was launched in November 1998 and included health and environmental messages integrated within curricular and extracurricular activities. However, revision of official school books for health and environmental content revealed several handicaps and lack of consistency in the flow of some subjects across grade levels (Makhoul, 2000). Moreover, school surveys demonstrated that more effort should be invested in the domains of various health practices, including accidents and injury prevention (WHO, 1999b).

The SHP was reinforced through a memorandum of understanding between the Ministry of Public Health (MPH), Ministry of Education and Higher Education (MEHE), and WHO in 2006 for mobilizing the commitment of both ministries by strengthening national ownership of the program, improving the use of national health data, and fostering participation of the private sector (WHO, 2010). Alarming data about Lebanese adolescents were obtained from the Global School-Based Health Survey (GSHS; WHO, MEHE, MPH, & Centers for Disease Control and Prevention [CDC], 2005). It revealed prevalence of alcohol (20%) and other drugs (3.4%); poor dietary behaviors with obesity (5%) and overweight (23.3%); mental health issues (15.8% entertaining suicidal thoughts); violence (45.9%); and bullying (33.9%) among seventh, eighth, and ninth grade students. Reassessment of the Lebanese Integrated Health Curriculum was recommended, as was content editing for risk behaviors that need to be addressed at earlier ages. The Global Youth Tobacco Survey (GTYS) by Saade, Abou Jaoude, Afifi, Warren, and Jones (2005) revealed that 60.1% of adolescents aged 13–15 years use tobacco and the need for urgent awareness programs to stop the growing smoking epidemic. In 2008, the Pompidou Group and Saint Joseph University survey for Lebanese Grade 9 students demonstrated that 60% were already smoking, 85% knew about weed, and 22% reported knowing someone who used it. Prevention and skills training must be initiated as early as possible during the complementary school cycles.

The GSHS 2010 figures were still alarming, highlighting the need for serious consideration of the national SHP. The rate of students who had their first alcohol drink before the age of 14 was 87.5%. Almost one fourth were overweight (24.1%), 6.7% were obese, and 60.2% consumed carbonated beverages. Approximately one third did not practice any physical activity during the past 12 months of the survey. National figures for childhood obesity revealed that 22.5% of boys and 16.1% of girls were overweight (Sibai et al., 2003). Chakar and Salameh (2006, 2007) further demonstrated this problem among adolescents in Lebanese schools. Moreover, Salameh and Barbour (2011a, 2011b) revealed high rates of obesity and diabetes among Lebanese adolescents (11–18 years old). Alarming rates (10.3%) of abnormal random fasting blood sugar (> 140 mg/dl) were documented. Boys had higher rates than girls did on the

overweight dimension (4.7% vs. 1.3%) and higher risk on the obesity dimension (26.7% vs. 10.7%).

The Lebanese School Health Strategy was developed to improve the health status of children and school personnel, to provide a safe learning environment for students and workplace for staff, and to reinforce the relationship between education and health professionals and the community (Republic of Lebanon, MEHE, 2009). In 2010, the MEHE and the WHO undertook a joint activity to establish a network of 10 HPS. The aim of this pilot project was to transfer public schools from implementing the routine SHP to be health promoting and to reinforce partnerships between the education and health sectors. Thirty-five teaching and administrative staff were trained regarding objectives of the HPS model, its scope, and their role in implementation and sustainability. Training included application of the SHP, support for the school health worker, and implementation of at least one activity per year. However, no studies have been done to date to evaluate the effectiveness of the training and efficiency of the HPS network in preventing and/or reducing risk behaviors among students or school populations. The objective of this research was to evaluate the impact of these interventions on students' behaviors related to dietary physical activity practices.

Method

Research Design

This research was implemented to explore school health services, students' practices regarding diet and physical activity, and the extent to which the HPS was promoting adolescents' well-being. It was carried out during the academic year 2011–2012 and involved a comparison between 10 public schools, which constitute the HPS network, and 10 other public and 10 private schools. Control schools were chosen from the same geographic regions (10 regions) as the HPS and were matched for size and student characteristics (age, gender, and grade levels). A quantitative research design was used to implement the survey questionnaires. Anthropometric measures were also taken to validate subjective data.

Sampling Procedure

The study was a school-based survey of Lebanese public and private schools. Schools containing Grades 6–9 and having more than 50 students in the designated grade levels were included in the sampling frame. A two-stage cluster sample design was used to produce a representative sample of students. All students within the selected grade levels were eligible to participate by responding to the survey questionnaire. The response rate was 96.2%, with 2,188 questionnaires distributed and 2,105 collected.

Research Instruments

The Youth Risk Behavior Survey (YRBS) developed by the CDC (2011) was used with permission and was translated to the Arabic language. The survey consisted of 47 multiple-choice questions addressing prevalent risk behaviors. For the purpose of increasing compliance rate, culturally sensitive items were deleted. The MEHE requested removing questions that dealt with sexual practices, contraception, and drug addiction, which are still considered taboo issues. Eleven questions were deleted from the questionnaire (see Appendix). It was pilot tested in one randomly chosen public school, few questions were revised, and the questionnaires were back translated to validate content. Original and translated versions were then matched to ensure accuracy of translation.

Height and weight measurements were undertaken on a random number of schools from the sample, and all students within the selected grade levels were included (703 students). These were obtained for purposes of triangulation with subjective data and used to compute anthropometric measures based on the International Obesity Task Force (IOTF, 2005) guidelines. Values were then used to compute the BMI for students in the designated sample.

Approval of the MEHE was obtained before the study was initiated. Participants were assured that data would be used for research purposes only with no penalty for nonparticipation. All schools accepted to participate in the survey and appointments were arranged for data collection extending from November 2011 to June 2012. Anonymity and confidentiality of all respondents were respected.

Data Analysis

The questionnaires were auto-completed in 30–45 minutes in the presence of the surveyor, who provided support as needed. Height and weight measurements were obtained during the same visit. Collected data were grouped and analyzed using SPSS for parametric statistics. All variables were described as frequencies and percentages for categorical variables and as means and standard deviations for continuous variables. Data were described in univariate, bivariate, and multivariate analyses to document change in patterns of students' attitudes and behaviors following the implementation of HPS in Lebanese public schools.

For bivariate analysis, the chi-square test was used to compare between group percentages, and an ANOVA was used to compare quantitative variables between two or more groups, respectively. Multivariate analysis was carried out to identify multiple predictor variables on the occurrence of the dependent variables under investigation, using a backward descending regression. Sociodemographic characteristics were used as independent potential confounding variables.

Results

Participants' Demographic Data

All students in the school sample Grades 6–9 participated in the survey. Participants' ages ranged between 10 and 15 years, with females constituting 58.9% of the sample. Overall, the number of participants was 749 in private schools, 675 in HPS, and 678 in public non-HPS, with $p < 0.001$. Respondents were almost evenly distributed among Grades 6–9 in public schools (HPS and non-HPS).

Participants' reported heights ranged from 59–201 cm and weights ranged from 23–167 kg. Corrected measures of height and weight revealed a significant difference across schools of the sample regarding sample height. Private schools had higher mean height of 156.611 cm, with $p < 0.001$. Moreover, BMI values revealed that males in public schools (HPS and non-HPS) had higher values for normal weight (69% and 74.9%, respectively). Males in private schools had higher values for overweight (23.3%). Females in private schools, on the other hand, had higher values for normal weight (73%), and higher values of overweight were reported in public schools (22%). Our findings were not significant for neither male ($p = 0.037$) nor female ($p = 0.366$) students, as shown in Table 1.

Table 1

Comparison of Female and Male Students' BMI Across Public HPS, Public Non-HPS, and Private Schools: Academic Year 2011–2012

	School category					
BMI category	**Public HPS *n* (%)**	**Public non-HPS *n* (%)**	**Private *n* (%)**	**Total *n* (%)**	**χ^2**	***p***
Male BMI						
Thin	14(5.6)	14(7.8)	14(4.2)	42(5.5)	13.128	
Normal	174(69)	134(74.9)	214(64.8)	522(68.6)	47.683	
Overweight	46(18.3)	21(11.7)	77(23.3)	144(18.9)	19.669	
Obese	18(7.1)	10(5.6)	25(7.6)	53(7)	13.013	
TOTAL	**252(100)**	**179(100)**	**330(100)**	**761(100)**	**13.421**	**0.037**
Female BMI						
Thin	14(3.7)	13(3.4)	6(1.8)	33(3)	8.712	
Normal	262(69.3)	256(67)	236(73)	756(69.6)	37.606	
Overweight	84(22.2)	84(22)	64(19.6)	232(21.4)	42.608	
Obese	18(4.8)	29(7.6)	18(5.5)	65(6)	10.107	
TOTAL	**378(100)**	**382(100)**	**326(100)**	**1086(100)**	**6.539**	**0.366**

Cut values adapted from Cole et al. (2000), IOTF Childhood Obesity Working Group.

Diet Practices and Physical Activity

Most male students reported regular physical activity for 1–2 days during the week, with no significant differences among schools. Females in private schools reported more engagement in physical activity for at least 1–2 days during the past 7 days of the survey (43.7%), with $p < 0.001$ as documented in Table 2.

Table 2

Comparison of Physical Activity Behavior Across Public HPS, Public Non-HPS, and Private Schools: Females—Academic Year 2011–2012

	School category					
Physical activity behavior	**Public HPS 403–404 (%)**	**Public non-HPS 455–458 (%)**	**Private 356–357 (%)**	**Total 1215-1218 (%)**	χ^2	*p*
Activity During Past 7 Days					**31.067**	**< 0.001**
None	139(34.2)	188(41.5)	87(24.2)	414(34)		
1–2 Days	143(35.1)	155(34.2)	157(43.7)	455(37.3)		
3–4 Days	58(14.3)	58(12.8)	51(14.2)	167(13.7)		
5–6 Days	23(5.7)	23(5.1)	23(6.4)	69(5.7)		
All 7 Days	**44(10.8)**	**29(6.4)**	**41(11.4)**	**114(9.4)**		
TV Watching Hours					**28.749**	**< 0.001**
Don't Watch TV	29(7.1)	61(13.2)	25(7)	115(9.3)		
1 ≤ Hr	94(23)	150(32.4)	113(31.5)	357(29)		
2–3 Hr	173(42.4)	150(32.4)	142(39.6)	465(37.8)		
4 ≥ 5 Hr	112(27.5)	102(22)	79(22)	293(23.8)		

Females in private schools also reported spending more time (4 ≥ 5 hr/day) on electronic games than did their colleagues in other schools of the sample (12.3%), with $p < 0.001$.

In addition, they reported engaging in physical education for at least 1–2 days/week (60.7%), with $p < 0.001$. The figures for males were not significant on these variables. No significant differences were observed among students (males and females) with respect to participating in team sports, as shown in Table 3.

Table 3

Comparison of Physical Activity Behavior Across Public HPS, Public Non-HPS, and Private Schools: Females—Academic Year 2011–2012

	School category					
Physical activity behavior	**Public HPS 403–404 (%)**	**Public non-HPS 455–458 (%)**	**Private 356–357 (%)**	**Total 1215–1218 (%)**	χ^2	*p*
Electronic Games					**29.745**	**< 0.001**
Don't Play Games	149(37)	187(40.8)	96(26.9)	432(35.5)		
1 ≤ Hr	152(37.7)	181(39.5)	152(42.6)	485(39.8)		
2–3 Hr	76(18.9)	66(14.4)	65(18.2)	207(17)		
4 ≥ 5 Hr	26(6.5)	24(5.2)	44(12.3)	94(7.7)		
Physical Education Days					**40.913**	**< 0.001**
None	**189(46.8)**	**237(52.1)**	**117(32.9)**	**543(44.7)**		
1–2 Days	205(50.7)	204(44.8)	216(60.7)	725(51.4)		
3–4 Days	4(1)	10(2.2)	8(2.2)	22(1.8)		
5 Days	6(1.5)	4(0.9)	15(4.2)	25(2.1)		
4 ≥ 5 Hr	112(27.5)	102(22)	79(22)	293(23.8)		

Multivariate analysis was used to analyze student dietary practices. When we adjusted for obesity with sociodemographic characteristics and receiving health education, the relationship between HPS and obesity remained significant. Students in higher grades ($p < 0.001$) and students who used fasting ($p = 0.013$), vomiting, and laxative products ($p=0.013$) were more likely to be obese (Table 4).

Table 4
Multivariate Analysis for Obesity: (r^2 = %14)

Variable	OR_a / Exp (β)	CI (95%)	*p*
School Type			
Public HPS			**0.016**
Public Non-HPS	1.33	0.76–2.32	**0.324**
Private	2.05	1.18–3.57	**0.011**
Age (years)	1.54	1.35–1.75	**< 0.001**
Fasting for Hours	1.55	1.09–2.19	**0.013**
Vomiting/Laxatives	2.28	1.19–4.35	**0.013**
Student Participation in Sports Events	0.52	0.28–0.99	**0.046**
Using School Premises for Sports Events	0.42	0.20–0.87	**0.020**
Administrative/Evaluative Methods for Physical Activity	0.50	0.30–0.82	**0.002**
HE Training on Diet	5.62	2.30–13.72	**< 0.001**

When the we adjusted the "watching TV" habit to sociodemographic characteristics and receiving "health education," the results revealed that students in non-HPS schools watched TV less compared to those in HPS ($p = 0.002$). Obligatory physical education at school (though failed to reach significance, $p = 0.083$) and utilizing school premises for community sports events were found to be in favor of less "TV watching," with $p < 0.001$ as revealed in Table 5.

Table 5
Multivariate Analysis for Watching TV for 2 Hours or More per Day

Variable	OR_a / Exp (β)	CI (95%)	*p*
School Type			
Public HPS			**0.01**
Public Non-HPS	0.66	0.51–0.86	**0.002**
Private	0.80	0.59–1.08	**0.15**
Gender	1.63	1.27–2.10	< **0.001**
School Bullying	1.39	0.97–1.98	**0.075**
Ecstasy Inhalers	1.88	1.40–2.53	< **0.001**
Playing Electronic Games			
Don't Play Games			< **0.001**
1 ≤ Hr	1.79	1.38–2.34	< **0.001**
2–3 Hr	3.87	2.74–5.46	< **0.001**
4 ≥ 5 Hr	8.00	4.74–13.51	< **0.001**
Weight Description			
Below Weight			< **0.001**
Ideal Weight	1.45	1.11–1.91	**0.006**
Above Weight	2.16	1.54–3.01	< **0.001**
Obligatory Physical Education	**0.56**	**0.29–1.08**	**0.083**
Using School Premises for Sport Events	**0.65**	**0.51–0.83**	< **0.001**

Results revealed that risk behaviors were similar among students in all types of schools, indicating no advantage of HPS over others in the sample.

Discussion

Obesity among adolescents was found to be associated with negative psychosocial and health problems such as diabetes and hypertension, which interfere with school performance (Daniels et al., 2005). Musaiger (2004) demonstrated this fact and marked an increase in obesity rates among adolescents ranging from 7% to 45%, relating this to poor health practices, also. Our rates revealed that males in public schools (HPS and non-HPS) had higher values for normal weight (69% and 74.9%, respectively), and those in private schools had higher values for overweight (23.3%). Females in private schools, on the other hand, had higher values for normal weight (73%) and overweight (22%). Findings were not significant for male nor female students (Table 1).

Our findings corroborate with Chakar and Salameh (2006) regarding the prevalence and risk of obesity. They reported an obesity rate of 7.5% and risk of obesity of 24.4% among 12,299 adolescents. They highlighted the importance

of early recognition and management of this condition during adolescence. Findings also corroborate with the GSHS (WHO et al., 2010) in which 24.1% of adolescents reported being overweight and 6.7% obese. Fazah et al. (2010) revealed similar national Lebanese rates for overweight of 22.5% among male and 12.4% among female adolescents and recommended the implementation of effective strategies to increase physical activity and health-related practices for better quality of life. High prevalence rates of overweight and obesity were also reported for boys (22.5%, 7.5%) and girls (16.1%, 3.2%) by Sibai et al. (2003), who recommended implementation of interventions at community and individual levels to promote weight control measures.

Multivariate analysis demonstrated that students who belong to schools that allow use of their premises for physical activities ($p = 0.002$) and who participate in community sports events ($p < 0.046$) were less likely to be obese (Table 5). Schools that had administrative procedures and evaluative methods for physical activity were protective against student obesity ($p = 0.002$; Table 4). Although 49.6% of our male and 51% our female youth sample reported having ideal body weights, 33.6% of males and 45.2% of females revealed their desire to lose weight, especially in private schools, highlighting the role of media on youth's self-image. Adolescents regardless of school type had similar health practices leading to elevated BMI figures. This demonstrates the importance of integrating them as effective partners in SHP.

Participation in regular physical activity can help young people build and maintain body weight, reduce body fat, and eliminate feelings of depression and anxiety, thus improving school performance (Strong et al., 2005). It helps adolescent students develop the knowledge, attitudes, and skills necessary to adopt an active lifestyle (Dishman et al., 2005). Physical activity was better practiced by females in private schools (43.7%), with $p < 0.001$ (Table 2). On the other hand, 44.7% of our female participants did not attend regular physical education classes, especially those in HPS (46.8%) and non-HPS (52.1%), with $p < 0.001$ (Table 3). Rates for male students were not significant across schools.

Screen games are considered sedentary activities associated with obesity and negative consequences on the health and performance of adolescents (Kaur, Choi, Mayo, & Harris, 2003). The more adolescents indulge in watching TV and using the computer, the more they become physically and socially inactive. Fazah et al. (2010) further demonstrated that normal weight adolescents were more active than their obese peers and correlated more screen time with high obesity and overweight. This corroborates with our results that 37.8% of female students reported watching TV for 2–3 hours daily, more so in HPS ($p < 0.001$; Table2). Also 39.8% reported playing electronic games for at least 1 hour daily, more so in private schools ($p < 0.001$; Table 3). Multivariate analysis demonstrated that when we adjusted "watching TV" habit with sociode-

mographic characteristics and receiving "health education," students in non-HPS schools tended to watch TV less compared to HPS students ($p = 0.002$). Moreover, female students ($p = 0.002$) playing electronic games for hours was associated with longer TV watching hours. Obligatory physical education at school and the possibility of utilizing school premises for community sports events ($p < 0.001$) were found to be in favor of less "TV watching" (Table 5). Also alarming was the consumption of steroids (2.6–3.3%) and enhancers (5–5.7%) by males and females across different schools of the sample, which needs to be further examined.

Unhealthy weight control behaviors including fasting, taking dietary products, or inducing vomiting were observed in all three types of schools in our sample. Engaging in such behaviors may result in physical and psychological health problems and eating disorders such as anorexia, bulimia, and stunted growth (Golden et al., 2003). These health conditions negatively affect school performance because they cause high levels of stress and depression (Neumark-Sztainer & Hannan, 2000; Salameh & Barbour, 2011a, 2011b). Prevalent dietary habits include consumption of fast food, sugar-sweetened beverages, and caffeine-rich drinks. Such foods were associated with long-term health consequences including overweight among adolescents, decreased bone density, and dental decay (Tahmassebi, Duggal, Malik-Kotru, & Curzon, 2006). Effort should be exerted within a supportive school environment to teach nutrition education that includes concepts that promote healthy eating.

Sports and social events are mostly sponsored by fast-food and beverages companies. Students tend to interpret such advertising to mean that their school endorses the use of such products (Wilox et al., 2004). Alverman and Hagwood (2000) recommended providing students with media literacy skills, to counteract unhealthy attitudes and practices. Poor nutritional content of food sold during school-sponsored events jeopardizes formal health education regarding healthy nutrition within school curricula (Ozer, 2007). Easy access to nonnutritious snack foods through vending machines and school shops or canteens, combined with limited time allocated to eating a full meal, lead students to select nonnutritious snacks. Along these lines, Mahfouz et al. (2011) reported an obesity rate for adolescents (11–19 years) of 23.2% among boys and 29.4% among girls in Saudi Arabia. They recommended the need for a national education program to prevent and control obesity among adolescents. Barriers within the school environment undermine the effectiveness of HPS initiatives and interfere with program implementation and achievement of desired outcomes. Nasereddine et al. (2012) reported the mean BMI values for 2,004 subjects in 1997 and 3,636 in the 2009 among different age and gender groups over 12 years. They reported that the prevalence of overweight appeared stable over the study period among the 6–19 years age group (20.0% vs. 21.2%). The prevalence of obesity, however, increased significantly from 7.3% to 10.9%, with

annual rates of change of about 4.1%. They highlighted the alarming increase in obesity prevalence and recommended policies and strategies to counteract this trend. Moreover, Sukarieh and Sidani (2014) reported BMI cutoff points for overweight and obese of 8.9% and 5.1% for males and 12.7% and 3.8% for females. Females had higher scores on emotional and binge eating and were more likely to engage in dramatic dieting and weight loss attempts because of family, peer, and media pressures. Males, on the other hand, were more likely to engage in weight gain attempts. Boys and girls were equally unhappy about their body shape, with 59.4% of girls and 56% of boys expressing their desire to lose weight. These figures support our findings of 33.6% of female and 45.2% of male adolescents revealing dissatisfaction with their image and desire to lose weight.

Absence of information about strengths and weaknesses of the current SHP and time constraints regarding data collection considering that students' official exams were scheduled in mid-May 2012 were among study limitations, together with biases inherent in self-report methodology. Reported data are cross-sectional; therefore, no conclusions regarding the direction of causality can be drawn. Moreover, generalizations cannot be made to youth in other settings such as technical schools or to school dropouts considering that these populations may have higher levels of risk behaviors.

Conclusion

There is a need to study education and health trajectories and the degree to which they intertwine and influence each other and the life of individual students through different stages of development. Evidence gathered from this study reveals poor investment at all levels for implementation, sustainability, and evaluation of this comprehensive school initiative. Added is the absence of follow-up and process evaluation, rendering health education, services, and activities within all schools dependent to a great extent on intuition and individual initiatives. Such initiatives cannot have long-term longevity, because they cannot be duplicated, reproduced, or tailored to needs of specific adolescent groups and communities. Thus, national policies and guidelines should be developed and reinforced to transcend circumstantial obstacles and render the HPS model applicable for different schools and communities.

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Appendix

2011 MIDDLE SCHOOL YOUTH RISK BEHAVIOR SURVEY

This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to improve health education for young people like yourself.

DO NOT write your name on this survey. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do.

Completing the survey is voluntary. Whether or not you answer the questions will not affect your grade in this class. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing this survey. The information will not be used to find out your name. No names will ever be reported.

Make sure to read every question. Fill in the ovals completely. When you are finished, follow the instructions of the person giving you the survey.

Thank you very much for your help.

DIRECTIONS

Use a #2 pencil only.

- **Make dark marks.**
- **Fill in a response like this: A B C D**
- **If you change your answer, erase your old answer completely.**

1. How old are you?
   a. 10 years old or younger
   b. 11 years old
   c. 12 years old
   d. 13 years old
   e. 14 years old
   f. 15 years old
   g. 16 years old or older
2. What is your sex?
   a. Female
   b. Male

3. In what grade are you?
   a. 6th grade
   b. 7th grade
   c. 8th grade
   d. Ungraded or other grade
4. Are you Hispanic or Latino?
   a. Yes
   b. No
5. What is your race? (Select one or more responses.)
   a. American Indian or Alaska Native
   b. Asian
   c. Black or African American
   d. Native Hawaiian or Other Pacific Islander
   e. White

The next 4 questions ask about safety.

6. When you ride a bicycle, how often do you wear a helmet?
   a. I do not ride a bicycle
   b. Never wear a helmet
   c. Rarely wear a helmet
   d. Sometimes wear a helmet
   e. Most of the time wear a helmet
   f. Always wear a helmet
7. When you rollerblade or ride a skateboard, how often do you wear a helmet?
   a. I do not rollerblade or ride a skateboard
   b. Never wear a helmet
   c. Rarely wear a helmet
   d. Sometimes wear a helmet
   e. Most of the time wear a helmet
   f. Always wear a helmet
8. How often do you wear a seat belt when riding in a car?
   a. Never
   b. Rarely
   c. Sometimes
   d. Most of the time
   e. Always

9. Have you ever ridden in a car driven by someone who had been drinking alcohol?
    a. Yes
    b. No
    c. Not sure

The next 3 questions ask about violence-related behaviors.

10. Have you ever carried a weapon, such as a gun, knife, or club?
    a. Yes
    b. No
11. Have you ever been in a physical fight?
    a. Yes
    b. No
12. Have you ever been in a physical fight in which you were hurt and had to be treated by a doctor or nurse?
    a. Yes
    b. No

The next 2 questions ask about bullying. Bullying is when 1 or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when 2 students of about the same strength or power argue or fight or tease each other in a friendly way.

13. Have you ever been bullied on school property?
    a. Yes
    b. No
14. Have you ever been electronically bullied? (Include being bullied through e-mail, chat rooms, instant messaging, Web sites, or texting.)
    a. Yes
    b. No

The next 3 questions ask about attempted suicide. Sometimes people feel so depressed about the future that they may consider attempting suicide or killing themselves.

15. Have you ever seriously thought about killing yourself?
    a. Yes
    b. No

16. Have you ever made a plan about how you would kill yourself?
    a. Yes
    b. No
17. Have you ever tried to kill yourself?
    a. Yes
    b. No

The next 8 questions ask about tobacco use.

18. Have you ever tried cigarette smoking, even one or two puffs?
    a. Yes
    b. No
19. How old were you when you smoked a whole cigarette for the first time?
    a. I have never smoked a whole cigarette
    b. 8 years old or younger
    c. 9 years old
    d. 10 years old
    e. 11 years old
    f. 12 years old
    g. 13 years old or older
20. During the past 30 days, on how many days did you smoke cigarettes?
    a. 0 days
    b. 1 or 2 days
    c. 3 to 5 days
    d. 6 to 9 days
    e. 10 to 19 days
    f. 20 to 29 days
    g. All 30 days
21. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
    a. I did not smoke cigarettes during the past 30 days
    b. Less than 1 cigarette per day
    c. 1 cigarette per day
    d. 2 to 5 cigarettes per day
    e. 6 to 10 cigarettes per day
    f. 11 to 20 cigarettes per day
    g. More than 20 cigarettes per day

22. During the past 30 days, how did you usually get your own cigarettes? (Select only one response.)
    a. I did not smoke cigarettes during the past 30 days
    b. I bought them in a store such as a convenience store, supermarket, discount store, or gas station
    c. I bought them from a vending machine
    d. I gave someone else money to buy them for me
    e. I borrowed (or bummed) them from someone else
    f. A person 18 years old or older gave them to me
    g. I took them from a store or family member
    h. I got them some other way
23. Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?
    a. Yes
    b. No
24. During the past 30 days, on how many days did you use chewing tobacco, snuff, or dip, such as Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen?
    a. 0 days
    b. 1 or 2 days
    c. 3 to 5 days
    d. 6 to 9 days
    e. 10 to 19 days
    f. 20 to 29 days
    g. All 30 days
25. During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars?
    a. 0 days
    b. 1 or 2 days
    c. 3 to 5 days
    d. 6 to 9 days
    e. 10 to 19 days
    f. 20 to 29 days
    g. All 30 days

The next 2 questions ask about drinking alcohol. This includes drinking beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

26. Have you ever had a drink of alcohol, other than a few sips?
    a. Yes
    b. No
27. How old were you when you had your first drink of alcohol other than a few sips?
    a. I have never had a drink of alcohol other than a few sips
    b. 8 years old or younger
    c. 9 years old
    d. 10 years old
    e. 11 years old
    f. 12 years old
    g. 13 years old or older

The next 2 questions ask about marijuana use. Marijuana also is called grass or pot.

28. Have you ever used marijuana?
    a. Yes
    b. No
29. How old were you when you tried marijuana for the first time?
    a. I have never tried marijuana
    b. 8 years old or younger
    c. 9 years old
    d. 10 years old
    e. 11 years old
    f. 12 years old
    g. 13 years old or older

The next 4 questions ask about other drugs.

30. Have you ever used any form of cocaine, including powder, crack, or freebase?
    a. Yes
    b. No

31. Have you ever sniffed glue, breathed the contents of spray cans, or inhaled any paints or sprays to get high?
    a. Yes
    b. No
32. Have you ever taken steroid pills or shots without a doctor's prescription?
    a. Yes
    b. No
33. Have you ever taken a prescription drug (such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin, or Xanax) without a doctor's prescription?
    a. Yes
    b. No

The next 4 questions ask about sexual intercourse.

34. Have you ever had sexual intercourse?
    a. Yes
    b. No
35. How old were you when you had sexual intercourse for the first time?
    a. I have never had sexual intercourse
    b. 8 years old or younger
    c. 9 years old
    d. 10 years old
    e. 11 years old
    f. 12 years old
    g. 13 years old or older
36. With how many people have you ever had sexual intercourse?
    a. I have never had sexual intercourse
    b. 1 person
    c. 2 people
    d. 3 people
    e. 4 people
    f. 5 people
    g. 6 or more people

37. The last time you had sexual intercourse, did you or your partner use a condom?
    a. I have never had sexual intercourse
    b. Yes
    c. No

The next 5 questions ask about body weight.

38. How do you describe your weight?
    a. Very underweight
    b. Slightly underweight
    c. About the right weight
    d. Slightly overweight
    e. Very overweight
39. Which of the following are you trying to do about your weight?
    a. Lose weight
    b. Gain weight
    c. Stay the same weight
    d. I am not trying to do anything about my weight
40. Have you ever gone without eating for 24 hours or more (also called fasting) to lose weight or to keep from gaining weight?
    a. Yes
    b. No
41. Have you ever taken any diet pills, powders, or liquids without a doctor's advice to lose weight or to keep from gaining weight? (Do not include meal replacement products such as Slim Fast.)
    a. Yes
    b. No
42. Have you ever vomited or taken laxatives to lose weight or to keep from gaining weight?
    a. Yes
    b. No

The next 5 questions ask about physical activity.

43. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
    a. 0 days
    b. 1 day
    c. 2 days
    d. 3 days
    e. 4 days
    f. 5 days
    g. 6 days
    h. 7 days
44. On an average school day, how many hours do you watch TV?
    a. I do not watch TV on an average school day
    b. Less than 1 hour per day
    c. 1 hour per day
    d. 2 hours per day
    e. 3 hours per day
    f. 4 hours per day
    g. 5 or more hours per day
45. On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Include activities such as Xbox, PlayStation, Nintendo DS, iPod touch, Facebook, and the Internet.)
    a. I do not play video or computer games or use a computer for something that is not school work
    b. Less than 1 hour per day
    c. 1 hour per day
    d. 2 hours per day
    e. 3 hours per day
    f. 4 hours per day
    g. 5 or more hours per day

46. In an average week when you are in school, on how many days do you go to physical education (PE) classes?
    a. 0 days
    b. 1 day
    c. 2 days
    d. 3 days
    e. 4 days
    f. 5 days
47. During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)
    a. 0 teams
    b. 1 team
    c. 2 teams
    d. 3 or more teams

The next 3 questions ask about other health-related topics.

48. Have you ever been taught about AIDS or HIV infection in school?
    a. Yes
    b. No
    c. Not sure
49. Has a doctor or nurse ever told you that you have asthma?
    a. Yes
    b. No
    c. Not sure
50. Do you still have asthma?
    a. I have never had asthma
    b. Yes
    c. No
    d. Not sure

This is the end of the survey.
Thank you very much for your help

Healthy Appearances in Lebanese Schools – 2011
Youth Risk Behavior Survey

DIRECTIONS

- **Circle the correct answer**
- **USE a pencil only.**
- **If you change your answer, erase your previous answer completely.**

1. How old are you?
   a. 10 years old or younger
   b. 11 years old
   c. 12 years old
   d. 13 years old
   e. 14 years old
   f. 15 years old or older
2. What is your sex?
   a. Female
   b. Male
3. In what grade are you?
   a. 6th grade
   b. 7th grade
   c. 8th grade
   d. 9th grade
4. How tall are you without your shoes?
   _____ m _____ cm
5. How much do you weigh without your shoes?
   _____ kg _____ gm

The next questions ask about safety.

6. When you ride a bicycle, how often do you wear a helmet?
   a. I do not ride a bicycle
   b. Never wear a helmet
   c. Rarely wear a helmet
   d. Sometimes wear a helmet
   e. Most of the time wear a helmet
   f. Always wear a helmet

7. When you use a rollerblade or ride a skateboard, how often do you wear a helmet?
   a. I do not rollerblade or ride a skateboard
   b. Never wear a helmet
   c. Rarely wear a helmet
   d. Most of the time wear a helmet
   e. Always wear a helmet
8. How often do you wear a seat belt when riding in a car?
   a. Never
   b. Rarely
   c. Sometimes
   d. Most of the time
   e. Always
9. Have you ever ridden in a car driven by someone who had been drinking alcohol?
   a. None
   b. Once
   c. 2 or 3 times
   d. 4 or 5 times
   e. 6 or more times

The next questions ask about violence-related behavior.

10. Have you ever carried a weapon, such a gun, knife, or club?
    a. Yes
    b. No
11. Have you ever been in a physical fight?
    a. Yes
    b. No
12. Have you ever been in a physical fight where you were hurt and had to be treated by a doctor or nurse?
    a. Yes
    b. No

The next questions ask about bullying. Bullying is when one or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not considered bullying when two students of the same strength argue or fight or tease one another in a friendly way.

13. Have you ever been bullied on school campus?
    a. Yes
    b. No
14. Have you ever been electronically bullied? (Include being bullied through e-mail, text messaging, Web sites, etc…)
    a. Yes
    b. No

The next questions ask about suicide. Sometimes people feel depressed about the future that they may consider attempting suicide or do something to end their lives.

15. Have you ever seriously thought about killing yourself?
    a. Yes
    b. No
16. Have you ever put a plan about how you would kill yourself?
    a. Yes
    b. No
17. Have you ever tried to actually kill yourself?
    a. Yes
    b. No

The next questions ask about tobacco use, alcohol and other drug use.

18. Have you ever tried cigarette smoking, even one or two puffs?
    a. Yes
    b. No
19. How old were you when you smoked a whole cigarette for the first time?
    a. I have never smoked a whole cigarette
    b. 8 years old or younger
    c. 9 years old
    d. 10 years old
    e. 11 years old
    f. 12 years old
    g. 13 years old or older

20. During the past 30 days, on how many days did you smoke cigarettes?
    a. 0 days
    b. 1 or 2 days
    c. 3 to 5 days
    d. 6 to 9 days
    e. 10 to 19 days
    f. 20 to 29 days
    g. All 30 days
21. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
    a. I did not smoke cigarettes during the past 30 days
    b. Less than 1 cigarette per day
    c. 1 cigarette per day
    d. 2 to 5 cigarettes per day
    e. 6 to 10 cigarettes per day
    f. 11 to 20 cigarettes per day
    g. More than 20 cigarettes per day
22. During the past 30 days, how did you usually get your cigarettes? (Select only one response.)
    a. I did not smoke cigarettes during the past 30 days
    b. I bought them from a convenience store, supermarket, shop or gas station.
    c. I bought them from a vending machine
    d. I gave someone else money to buy them for me
    e. I borrowed or took them from someone else
    f. A person 18 years old or older gave them to me
    g. I took them from a family member
    h. I got them some other way
23. Have you ever smoked cigarettes daily, that is, at least one cigarette everyday for 30 days?
    a. Yes
    b. No

24. During the past 30 days, on how many days did you use chewing tobacco or snuffs?
    a. 0 days
    b. 1 or 2 days
    c. 3 to 5 days
    d. 6 to 9 days
    e. 10 to 19 days
    f. 20 to 29 days
    g. All 30 days
25. During the past 30 days, on how many days did you smoke cigars, cigarellos, little cigars, or Arguile?
    a. 0 days
    b. 1 or 2 days
    c. 3 to 5 days
    d. 6 to 9 days
    e. 10 to 19 days
    f. 20 to 29 days
    g. All 30 days
26. Have you ever had a drink of alcohol, other than a few sips?
    a. Yes
    b. No
27. How old were you when you had your first drink of alcohol other than a few sips?
    a. I have never had a drink of alcohol other than a few sips
    b. 8 years old or younger
    c. 9 years old
    d. 10 years old
    e. 11 years old
    f. 12 years old
    g. 13 years old or older
28. Have you ever used marijuana?
    a. Yes
    b. No
29. Have you ever used any form of cocaine?
    a. Yes
    b. No

30. Have you ever sniffed glue, inhaled the contents of spray cans, or any paints?
    a. Yes
    b. No
31. During the current school year, did you receive instruction regarding the dangers of smoking, drinking alcohol or using drugs?
    a. Yes
    b. No

The next questions ask about body weight.

32. How do you describe your weight?
    a. Very underweight
    b. Slightly underweight
    c. About the right weight
    d. Slightly overweight
    e. Very overweight
33. Which of the following are you trying to do about your weight?
    a. Lose weight
    b. Gain weight
    c. Stay the same weight
    d. I am not trying to do anything about my weight
34. Have you ever gone without eating for 24 hours or more (fasting) to lose weight or to keep from gaining weight?
    a. Yes
    b. No
35. Have you ever taken any diet pills, powders, or liquids without a doctor's advice to lose weight or to keep from gaining weight? (Do not include meal replacement products such as Slim Fast.)
    a. Yes
    b. No
36. Have you ever vomited or taken laxatives to lose weight or to keep from gaining weight?
    a. Yes
    b. No

The next questions ask about physical activity.

37. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
    a. 0 days
    b. 1 day
    c. 2 days
    d. 3 days
    e. 4 days
    f. 5 days
    g. 6 days
    h. 7 days
38. On a regular school day, how many hours do you watch TV?
    a. I do not watch TV on an average school day
    b. Less than 1 hour per day
    c. 1 hour per day
    d. 2 hours per day
    e. 3 hours per day
    f. 4 hours per day
    g. 5 or more hours per day
39. On a regular school day, how many hours do you play video or computer games or use a computer for something that is not for school work? (Include activities such as Xbox, PlayStation, Nintendo, iPod, Facebook and the Internet.)
    a. I do not play video or computer games or use a computer for something that is not school work
    b. Less than 1 hour per day
    c. 1 hour per day
    d. 2 hours per day
    e. 3 hours per day
    f. 4 hours per day
    g. 5 or more hours per day
40. In an average week when you are in school, on how many days do you go to physical education classes (PE)?
    a. 0 days
    b. 2 days
    c. 3 days
    d. 4 days
    e. 5 days

41. During the past 12 months, on how many sports teams did you play? (Count any school teams, or community or neighborhood teams.)
    a. 0 teams
    b. 1 team
    c. 2 teams
    d. 3 or more teams
42. Have you ever taken steroid pills or injections without a doctor's proscription for the purpose of enhancing body shape?
    a. Yes
    b. No
43. Have you ever taken tranquilizers or enhancer drugs without a doctor's prescription to improve your physical performance?
    a. Yes
    b. No

The next questions ask about other health – related topics.

44. Have you ever been taught about AIDS or HIV infection in school?
    a. Yes
    b. No
    c. Not sure
45. During the current school year, did you receive education or instruction material concerning AIDS or HIV prevention?
    a. Yes
    b. No
46. Has a doctor or nurse ever told you that you have asthma?
    a. Yes
    b. No
    c. Not sure
47. Do you still have asthma?
    a. I have never had asthma
    b. Yes
    c. No
    d. Not sure

This is the end of the survey.
Thank you very much for your cooperation.

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Metabolic Syndrome as a Predictor of Incident Chronic Disease in Middle-Aged Chinese Persons

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Abstract

Background: Rising incidence of chronic diseases is a global phenomenon responsible for the greatest increase in burden of disease. **Objective:** To determine the prevalence of the metabolic syndrome (MetS) in a sample of middle-aged Chinese individuals and the onset of incident diabetes, hypertension, and hyperlipidemia in the ensuing 4 years. **Subjects:** 638 men and women born in 1956, 1960–1961, and 1964 in Yuci, Shanxi Province, China, were voluntarily enrolled. **Method:** Longitudinal study collecting anthropometric measures, blood chemistry, behavioral information, and disease information by survey, in 2008 and 2012 in the community health centers of Yuci, China. Data were analyzed using descriptive measures and regression analysis. **Results:** The rate of MetS in 2008 was 50.95% and 37.15% for men and women ($p = 0.001$) and in 2012 was 49.52% and 46.26% for men and women ($p = 0.438$). Regression analysis of the ability of MetS in 2008 to predict disease in 2012 resulted in odds ratios of 2.51 (1.43, 4.41), 26.82 (3.46, 207.68), and 4.06 (2.41, 6.86), for hypertension, diabetes, and hyperlipidemia. **Conclusion:** MetS has potential as a screening tool to predict incident chronic disease and to aid in improved primary disease prevention.

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Secondary data analysis: The Metabolic Syndrome study data set is available for secondary data analysis from the corresponding author by request.

Keywords

diabetes; preventive medicine; cardiovascular disease; obesity

Metabolic syndrome (MetS) is a concept used in health promotion to describe a cluster of risk factors that have been shown to identify individuals at high risk for eventual cardiovascular disease (CVD) or impaired glucose tolerance (Goldenberg & Punthakee, 2013). The risk factors include elevated waist circumference, elevated triglycerides (TG), reduced high-density lipoproteins (HDL), elevated blood pressure, and elevated fasting plasma glucose. MetS affects 20–30% of the population of developed countries (AlSaraj et al., 2009) and is associated with a significant risk of CVD and type 2 diabetes, especially in men over age 45 and women over age 55 (Lorenzo, Williams, Hunt, & Haffner, 2007). With increased economic prosperity in China has come a more sedentary lifestyle and a higher caloric intake, and chronic diseases now account for 80% of all deaths in China (Wang, Kong, Wu, Bai, & Burton, 2005), having increased significantly in recent years (Yang et al., 2012).

The development of diabetes and CVD in a population represents multiple routes of progression, depending on the start point and the pattern of development over time (Vistisen et al., 2014). Therefore, the longitudinal method used in this study allows for elucidation of the progression of MetS by describing the sequential appearance of the individual components of MetS. The theoretical perspective underlying this research is that as Chinese populations experience increased prosperity over time, MetS onset will begin earlier, and that the presence of MetS will predict the onset of hypertension, diabetes, and hyperlipidemia (Bragg et al., 2016). This creates the opportunity to compress the duration of morbidity by intervening in those people with MetS to prevent or delay the onset of disease (Andersen, Sebastiani, Dworkis, Feldman, & Perls, 2012).

This longitudinal study was designed to answer the question of whether the presence of MetS was able to predict new onset cases of hypertension, diabetes, or hyperlipidemia 4 years later. Our specific aims in this study were to

1. determine whether the presence of MetS in 2008 would significantly predict the likelihood of developing hypertension, diabetes, or hyperlipidemia in 2012;
2. compare prevalence of hypertension, diabetes, hyperlipidemia, and MetS between men and women from 2008–2012; and
3. explain which components lead to the presentation of hypertension, diabetes, and hyperlipidemia among men and women at different ages.

Method

Study Design and Population

This longitudinal cohort study was conducted to compare the rates of MetS in three age cohorts, born in 1956, 1960–1961, and 1964 in Yuci District, Jinzhong Prefecture, Shanxi Province, China. These age cohorts were chosen as part of a larger study comparing individuals born during (1960–1961 birth) with those born before and after (1954, 1956) the famine, respectively. Data were collected in the latter half of 2008 and 2012, respectively, in Yuci District (population 300,000). Yuci is a satellite city to the provincial capital of Taiyuan, and although many rural migrants have been absorbed into the city in recent years, in-migration from outside the province has been limited. Inclusion criteria required participants to have been born in Shanxi Province. Exclusion criteria included currently being treated for tuberculosis or cancer, taking corticosteroids, and pregnant.

Two thirds of the participants were recruited through 16 of 19 community health centers (CHC) in Yuci District, using the Health Record Database of each CHC, which contains the names of all enrolled individuals in its capitation area. Participants were recruited by phone invitation, posters in the community, and word of mouth. Intensity of recruitment varied by center, as did participation rate, with a high of 80% participation at one center but an average response rate of about 10%. Centers with a high population of residents born outside Jinzhong were not included in the data collection. The remaining one third of the participants were recruited through the Jinzhong First People's Hospital Health Examination Center. Individuals being examined at this facility are primarily healthy individuals whose employer arranges an annual physical exam. Informed consent was obtained from each participant before data collection.

A total of 806 people completed the cohort study in 2008, of which 13 were excluded because of failure to meet the inclusion criteria, resulting in a total of 793. A total of 638 completed the follow-up study in 2012, with a loss-to-follow-up rate of 19.5%. Of the 155 people who did not complete the follow-up study, 118 did not return, 16 refused, three died, six moved away, two developed serious disease, four were found to have been misclassified, five had incomplete records, and one was not fasting at the time of blood draw.

This research was done under the authority of the Shanxi Public Health Bureau and Yuci Public Health Bureau. It is the result of a collaboration between Shanxi Evergreen Service and the Jinzhong First People's Hospital, with the cooperation of Yuci Prefecture Women and Children's Hospital. The research proposal was approved by the Research Ethics Board (REB) of the University of Western Ontario and by the Jinzhong Prefecture Science Commission and Yuci District Public Health Bureau.

Data Collection

Laboratory. Overnight fasting blood samples were drawn by venipuncture to measure serum glucose, TG, total cholesterol, HDL, and low-density lipoproteins (LDL). All samples were analyzed within 3 hr at the Jinzhong People's Hospital Laboratory on a Roche Diagnostics Modular P800 Analyzer (Roche Diagnostics, Germany) using the reagent imported from Roche Diagnostics.

Anthropometric measurements. Body weight, height, and waist circumference were measured by trained staff according to the following protocol. Participants were weighed (without shoes) while wearing light summer clothes, and when the season changed, 1 to 2 kg were deducted to adjust for heavier fall and winter clothing. Standing height was measured in meters (without shoes) with the stadiometer attached to the scale (Su Hong Medical Equipment Company, Limited, Jiangsu, China). Measurements were taken to the nearest tenth of a centimeter. Waist circumference was measured with the participant standing erect using a standard tape measure. Measurement was taken at the umbilicus, the tape being horizontal and passing midway between the base of the rib cage and the iliac crest. BMI was calculated as kg/m^2.

Blood pressure measurement. At least two blood pressure measurements were obtained 1 min apart by trained nurses and physicians according to a standard protocol. The protocol was adapted from American Heart Association recommendations (Pickering et al., 2005). The blood pressure was the last procedure completed, to ensure that the participants had 30 min of rest after any exercise or smoking. A standard mercury sphygmomanometer was used, and this was calibrated at the Jinzhong People's Hospital Medical Equipment Department twice during the study. For this Chinese population, the standard cuff was suitable for all participants. All measurements were averaged.

Survey. A 47-item questionnaire was administered by trained research staff to all participants, assessing demographic data; personal medical history of hypertension, diabetes, and heart disease; physical activity of more than 150 min/week (moderate and vigorous activity done for more than 10 min a time, including commute, work, and leisure); smoking (never smoked, quit more than 1 year, and smoke at least one cigarette a day); and alcohol intake volume and frequency (never, occasional, quit, and twice a week or more). The physical activity–level items were taken from the Chinese version of the International Physical Activity Questionnaire (IPAQ; Liou, Jwo, Yao, Chiang, & Huang, 2008).

Definition of Metabolic Syndrome

The primary outcome measure was rate of MetS as defined by the revised NCEP ATP III criteria (Grundy, 2005). We used the Asian criteria for waist circumference (Heng et al., 2006). MetS is the presence of three or more of the following risk determinants:

1. increased waist circumference (≥ 90 cm for men, ≥ 80 cm for women);
2. elevated TG (TG ≥ 1.7 mmol/L [150 mg/dl]) or treatment for this lipid abnormality;
3. low high-density lipoprotein (HDL) cholesterol (HDL < 1.03 mmol/L [< 40 mg/dL] in men, HDL < 1.29 mmol/L [50 mg/dL] in women) or treatment for this lipid abnormality;
4. hypertension (≥ 130/≥ 85 mmHg) or treatment for hypertension; and
5. impaired fasting glucose (IFG ≥ 5.6 mmol/L [100 mg/dl]) or treatment for raised blood glucose.

Data Analysis

The first phase of the study (2008) included 793 participants. Phase 2 of the study (2012) included 643 of the original participants, for a follow-up rate of 81.08%. Responses from 643 participants who participated in both 2008 and 2012 were analyzed. Data on sociodemographic characteristics (gender, age, and employment status) and lifestyle (physical activity, alcohol intake, and smoking) were described using percentages, means, standard deviations, and 95% confidence intervals compared using ANOVA or chi-square tests. Odds ratios were calculated with logistic regression analysis, with all listed variables entered into the model simultaneously. Each disease was run separately. A 0.05 significance level was used for all tests. All analyses were performed using the statistical software SAS v 9.4 for Windows.

Results

In 2008, a higher proportion of men than women achieved 150 min/week of physical activity, although the difference was not statistically significant (Table 1). Four years later, 10% more women than men achieved the physical activity target, and the difference was significant. Nearly half of the men drank alcohol and around 62% of men smoked, and these proportions did not change from 2008 to 2012 (Table 1).

Table 1

Demographic Characteristics of the Study Sample

	Male sample (*n* = 210)		**Female sample (*n* = 428)**		***t* test *p* value**	
	n* (%) or *M* ± *SD		***n* (%) or *M* ± *SD***			
Characteristic	**2008**	**2012**	**2008**	**2012**	**2008**	**2012**
Age (years)	48.53 ± 3.08		48.44 ± 3.20		0.72	
Physical activity (> 150 min/week)	91 (43.33)	83 (39.52)	165 (38.55)	208 (48.60)	0.25	0.03

Table 1 (cont.)

Characteristic	Male sample (n = 210) n (%) or $M \pm SD$		Female sample (n = 428) n (%) or $M \pm SD$		t test p value	
	2008	**2012**	**2008**	**2012**	**2008**	**2012**
Alcohol	97 (46.19)	101 (48.10)	7 (1.64)	21 (4.91)	0.00	0.00
Smoking	129 (61.43)	131 (62.38)	5 (1.17)	4 (0.94)	0.00	0.00

Among the MetS components, men had higher blood pressure and higher fasting blood glucose at both time points, and these differences were statistically significant (Table 2). Men had higher mean TG levels and lower HDL levels than women did. Both TG and HDL levels remained the same for men from 2008 to 2012, but worsened for women (Table 2), contributing to increased rate of MetS among women (Table 3).

Table 2
Clinical Characteristics of the Study Sample

Characteristic	Male sample (n = 210) $M \pm SD$		Female sample (n = 428) $M \pm SD$		t test p value	
	2008	**2012**	**2008**	**2012**	**2008**	**2012**
Waist circumference (cm)	91.65 ± 8.7	90.00 ± 8.6	86.00 ± 8.9	84.37 ± 8.83	0.00	0.00
SBP (mm Hg)	128.60 ± 18.16	127.25 ± 16.46	123.24 ± 17.06	120.85 ± 15.67	0.00	0.00
DBP (mm Hg)	87.29 ± 11.91	85.68 ± 10.47	81.76 ± 10.60	79.74 ± 9.49	0.00	0.00
Blood Glucose (mmol/L)	6.03 ± 2.09	5.99 ± 1.88	5.51 ± 1.08	5.62 ± 1.32	0.00	0.01
Triglyceride	2.14 ± 1.84	2.01 ± 1.46	1.61 ± 1.06	1.77 ± 1.48	0.00	0.05
HDL (mmol/L)	1.15 ± 0.30	1.14 ± 0.30	1.39 ± 0.40	1.30 ± 0.33	0.00	0.00
LDL (mmol/L)	2.58 ± 0.95	2.68 ± 0.83	2.54 ± 0.79	2.79 ± 0.82	0.58	0.09

Table 3
Rate of Self-Reported Chronic Disease and Metabolic Syndrome

	Male sample (n = 210) $M \pm SD$		Female sample (n = 428) $M \pm SD$		Significance	
Characteristic	**2008**	**2012**	**2008**	**2012**	**2008**	**2012**
Hypertension	59 (28.10)	82 (39.05)	81 (18.93)	109 (25.47)	0.01	0.00
Diabetes	28 (13.33)	32 (15.24)	20 (4.67)	29 (6.78)	0.00	0.00
Hyperlipidemia	41 (19.52)	53 (25.24)	52 (12.15)	78 (18.22)	0.01	0.04
MetS	107 (50.95)	104 (49.52)	159 (37.15)	198 (46.26)	0.00	0.44

From 2008 to 2012, the self-reported rate of hypertension increased from 28.1% to 39.05% and from 18.9% to 25.5% for men and women, respectively (Table 3 and Figure 1). The same pattern of men with a higher rate than women, with both increasing from 2008 to 2012, was found with diabetes and hyperlipidemia. However, the rate of MetS in 2008 was 50.95% and 37.15% for men and women, respectively, but in 2012 the rate was 49.52% and 46.26% for men and women, respectively, a difference that was not statistically significant (p = 0.44; Table 3).

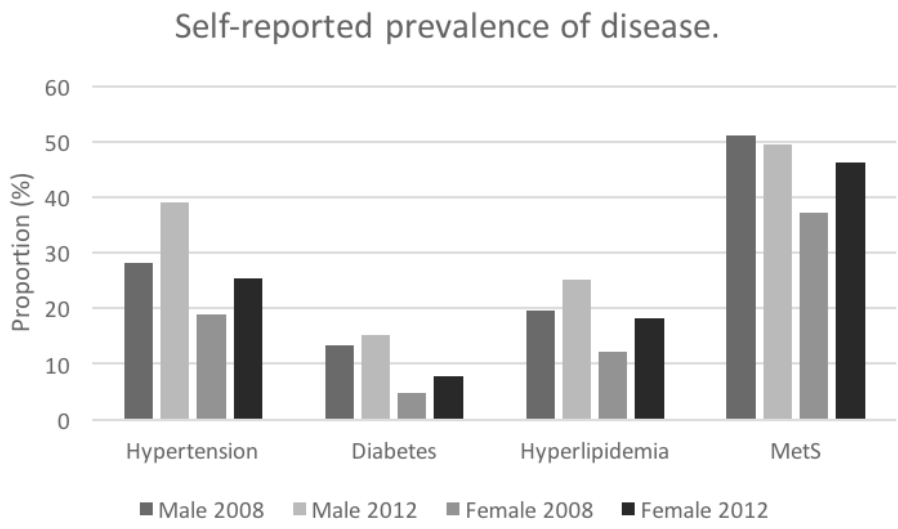

Figure 1. Self-reported prevalence of chronic disease by year and gender.

Logistic regression analysis was performed comparing predictor variables with each disease state. This analysis demonstrated that the presence of MetS in 2008 predicted the onset of incident hypertension, diabetes, and hyperlipidemia, with odds ratios of 2.51 (1.43, 4.41), 26.82 (3.46, 207.68), and 4.06 (2.41, 6.86), respectively (Table 4). Neither physical activity less than 150 min/week nor gender predicted onset of chronic diseases, and neither contributed to the regression model in a statistically significant manner (Table 4).

Table 4

Odds Ratio Estimate (95% CI) and Wald Confidence Intervals for Disease State as Dependent Variable (Controlled for Age, Gender, and Physical Activity Levels)

	Male sample (*n* = 210) *n* (%)		**Female sample (*n* = 428) *n* (%)**		**Significance**	
Characteristic	**2008**	**2012**	**2008**	**2012**	**2008**	**2012**
Hypertension	59 (28.10)	82 (39.05)	81 (18.93)	109 (25.47)	0.01	0.00
Diabetes	28 (13.33)	32 (15.24)	20 (4.67)	29 (6.78)	0.00	0.00
Hyperlipidemia	41 (19.52)	53 (25.24)	52 (12.15)	78 (18.22)	0.01	0.04
MetS	107 (50.95)	104 (49.52)	159 (37.15)	198 (46.26)	0.00	0.44

Discussion

In answer to the research question of this study, the presence of MetS in 2008 predicted the onset of incident hypertension, diabetes, and hyperlipidemia when we controlled for age. The prevalence of hypertension, diabetes, and hyperlipidemia were significantly higher among men than women at both time points, and the prevalence of all three increased from 2008 to 2012. The rate of MetS was significantly higher among men than among women in 2008, but the rate for women increased to be equivalent to that for men by 2012. In rural Shaanxi, S. Xu et al. (2014) found men to have higher rates of MetS from age 35–45 and women to surpass men at age 45 and beyond. Liang, Yan, Song, Cai, and Qiu (2013) showed that after age 60 the prevalence of MetS was 48.0% and 61.6% among men and women, respectively, which is in agreement with the results in the present study.

Neither physical activity less than 150 min/week nor gender predicted onset of chronic diseases, and neither contributed to the regression model in a statistically significant manner. The results of this study give confidence that the presence of MetS in a healthy middle-aged Chinese person can reasonably predict who will develop chronic diseases within the ensuing 4 years.

Men had higher blood pressure and higher fasting blood glucose than women did at both time points, and these differences were statistically significant. Men had higher mean TG and lower HDL levels than women did. Both TG and HDL levels remained the same for men, but worsened for women from 2008 to 2012. It has been shown among other Asian populations that postmenopausal women have increased LDL and TG levels (Furusyo et al., 2013). Therefore, weight control is of the utmost importance in preventing the cascade of events resulting in CVD and diabetes. A study of a rural Chinese population showed the peak mean TG level among men occurring at age 40–44, thereafter decreasing (Feng et al., 2006). In Jiangsu, China, Hu et al. (2006) found that the percentage of men with elevated TG peaked at 32% at age 35, declining thereafter, and the percentage of women with elevated TG rose steadily from 22% to 48% from age 40 to 65, when it plateaued.

It has been shown that insulin resistance (Reaven, 1988) and central adiposity (Carr et al., 2004) are the central underlying mechanisms through which MetS leads to CVD and diabetes. The MetS screening tool has been effectively used to predict impaired glucose tolerance; among those with MetS, the odds ratio for impaired glucose tolerance was 3–4, and the risk of developing diabetes was increased sixfold (Meigs et al., 2004). Among Chinese populations, blood glucose is the last MetS component to elevate. The Look AHEAD trial showed that once individuals have developed diabetes, intensive lifestyle interventions do not reduce their risk of myocardial infarction (Pi-Sunyer et al., 2007). Therefore, health promotion among Chinese populations should include diligent monitoring of blood glucose levels, with aggressive primary and secondary prevention to stop the progression to diabetes.

The observation that nearly half of men drank alcohol and around 62% of men smoked cigarettes and that these proportions did not change from 2008 to 2012 may be an indication of the underlying cause of these health outcomes among men. Men in China consume spirits more often than women do, contributing to MetS (Cai et al., 2012; Strand, Perry, & Wang, 2012). Smoking cessation appears to reduce the risk of MetS (Sun, Liu, & Ning, 2012). Key behavioral modification for health promotion activities in China should include management of alcohol intake, tobacco cessation, and increased physical activity (Strand et al., 2012; Strand, Perry, Wang, Liu, & Lynn, 2012). The effect of smoking on MetS was confounded by gender because the majority of men smoke and very few women smoke.

Although mortality due to CVD among women at age 45 is half that of men, it increases fourfold in women between ages 45 and 55 and is higher among menopausal women than men of comparable age (Kannel, Hjortland, McNamara, & Gordon, 1976; Prospective Studies Collaboration, 2002). Postmenopausal women in rural China had worse CVD risk factor profiles than did premenopausal women, which implied menopause might aggravate

the CVD epidemic beyond the effects of aging and would increase the CVD burden during and after their middle years (He et al., 2012).

Over the 4 years of this study, the proportion of men who achieved the physical activity target of 150 min/week did not change significantly, but the proportion of women who achieved the physical activity level target increased significantly and exceeded that of men by 2012. Many of the women in this study experienced menopause and the end of menses, which may have motivated them to exercise more to prevent weight gain. Some studies from non-Western countries have found menopause to predict MetS, but the results have been inconsistent (Carr, 2003; Estiaghi, Esteghamati, & Nakhjavani, 2010; Marroquin et al., 2004). It is also possible that many of the women in this study were retired by 2012, so they had more time to devote to exercise.

This study has contributed to the theoretical perspective that as China develops economically and socially, the people face increased risk of chronic disease onset. The ability of MetS to screen for individuals at increased risk of developing chronic diseases has also been shown, creating the opportunity for intervening in a way that compresses the duration of morbidity. Projections based on sample weighting suggest that China has 113.9 million people with diabetes and 493.4 million with prediabetes, so the economic and humanistic value of preventing diabetes in China cannot be overstated (Bragg et al., 2016; Y. Xu, Wang, & He, 2013). Clinical benefits of lifestyle intervention for patients with impaired glucose tolerance have been shown to effectively control the development of diabetes in Chinese populations (Li et al., 2014) Therefore, it is essential that preventive medicine do more to minimize weight gain and control blood glucose, blood pressure, and lipids earlier to prevent diabetes and CVD. By characterizing the differential onset of MetS by gender, this study contributes to the literature regarding the timing and content needed for men and women to prevent CVD and diabetes.

The people of Japan have the longest life expectancy in the world and arguably the most comprehensive national health care system. In 2008, the government of Japan implemented the National Metabolic Syndrome Examination and Health Guidance Mandate, which is a national screening program using MetS as a single point of entry to identify people who might benefit from an intervention to reduce CVD risk (Hosler, 2015; Kohro et al., 2008), and this has been followed up with interventions to test its effectiveness (Sakane et al., 2013). From 2008 to 2009, the prevalence of MetS declined by 21.2% and 29.7% among men and women after a year of intensive health guidance (Hosler, 2015). This demonstrates the ability to link lifestyle therapies, including weight reduction, increased physical activity, and an antiatherogenic diet, with scheduled MetS screening to reduce all of the components of MetS simultaneously (Rosenzweig et al., 2008). The only drugs that have the same effect are weight reduction drugs, but none of those are free of side effects. Therefore,

the presence of MetS is sufficient grounds to recommend the lifestyle modifications described above and thus offer prevention benefits for a cluster of diseases simultaneously.

Limitations

The generalizability of this study is limited to middle-aged people in urban areas of north central China. Disproportionate sampling by gender may have compromised the internal validity of this study, and small sample size compromised the statistical power of the study. Selection bias may have entered into the study as we do not know whether those lost to follow-up were different in any way. Dichotimizing the physiological parameters causes some loss of information, unless a threshold or bimodal distribution can be shown. However, MetS has been shown to be a consistent predictor of increased risk for CVD and diabetes (Kahn, Buse, Ferrannini, & Stern, 2005).

Future Research

The critical age when the rate of MetS among men increases could not be determined, because the rate of MetS for men in this study had already plateaued at the starting age of 44. This is a question that should be explored to better inform the timing of prevention efforts. The effect of menopause on CVD and diabetes also needs to be better understood. The third time point (2016) in this longitudinal study will determine whether rates for males and females continue the pattern observed here.

Future research should focus on clarifying the common metabolic pathways that underlie the development of diabetes and CVD, including those clustering within MetS. Population-based prevention strategies should also be developed and evaluated to determine context-specific reduction strategies that can be implemented in resource-limited settings (Simmons et al., 2010).

Conclusion

This longitudinal study has demonstrated the utility of the MetS screening tool to identify individuals at risk of developing hypertension, diabetes, or hyperlipidemia. The early onset and plateauing of MetS among men highlighted the importance of prevention efforts prior to the onset of risk factors among men, as early as in their 30s. In contrast, the delayed development of MetS among women and the steady increase with aging show that CVD and metabolic disorders are as important among women and require targeted prevention efforts unique to the needs of women. Elevated TG and elevated blood pressure were the most frequent risk factors for men, and elevated waist circumference and reduced HDL were the most frequent MetS risk factors among women. In an age when chronic diseases compromise the greatest contributor to burden of disease globally, MetS exists as a low-cost and highly feasible screening tool to use in early detection and prevention efforts.

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Committing to a Health Promotion Program: An Australian Case Study

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Abstract

An Australian exercise and health promotion program for older people with diabetes was examined to explore what factors are required for participants to commit to such a program. A two-phased qualitative hermeneutic phenomenology research design was used incorporating 15 semistructured interviews with adults aged over 55 with diabetes, followed by a focus group to member check emerging themes. Commitment was recognized as a necessary factor for participants to continue to be part of an exercise and health promotion program. Two factors were perceived to be most critical in committing to such a program: first, having an obligation to undertake the program—"*signing up and being part of*"—and second, "*continuing in and being actively engaged*" in the program. This second factor was seen to be influenced by person-centeredness and individualization, experiencing personal benefits and connectedness with others. The findings from this research could inform exercise and health promotion program strategies that then lead to increased engagement and stronger commitment of older people with diabetes to such programs.

Keywords

diabetes; health promotion; leisure; older people; commitment

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This paper examines what factors are required for older people with diabetes to commit to a program involving exercise and health promotion. In addition, it explores what an awareness of these factors implies. Findings were drawn from a research study whose aim was to understand the essence of meaning that older people with diabetes attribute to being involved in an exercise and health promotion program. The program was conducted in the state of NSW, Australia. The focus of this paper is on the specific factors related to commitment.

Background and Review of Literature

Diabetes is a widespread and chronic disease both in Australia and internationally, affecting 347 million people worldwide. The World Health Organization (WHO, 2015b) estimates diabetes will be the seventh leading cause of death by 2030, with a rise of more than 50% in total deaths from diabetes predicted over the next 10 years. In Australia, diabetes affects 5.2% of the population generally, with this increasing to 12.3% in those aged over 55 years (Australian Institute of Health and Welfare [AIHW], 2016). Despite the documented health benefits and strong evidence that undertaking exercise can improve diabetes outcomes (Hu, Wallace, McCoy, & Amirehsani, 2014), with estimates as high as 80% of diabetes being potentially preventable through improved modifiable risk factors such as unhealthy diet and sedentary habits (Annuzzi, Rivellese, Bozzetto, & Riccardi, 2014; Carson, Williams, & Hill, 2014), most people with type 2 diabetes do not commit to engaging in regular physical activity (Boudreau & Godin, 2014; Brouwer, Van Der Graaf, Soedamah-Muthu, Wassink, & Visseren, 2010).

Physical activity/exercise and health promotion are critical aspects of health and are particularly important for people of any age with diabetes. Physical inactivity is the fourth leading risk factor of global mortality, is a burden of risk to quality of life, causes an estimated 3.2 million (annual) deaths globally, and has a large financial cost implication associated with it (Li, 2014; Wasenius et al., 2014; WHO, 2015a). Regardless of these risks, sedentary behaviors and lifestyles are progressively more prevalent in contemporary society (Lakerveld, Bot, Van Der Ploeg, & Nijpels, 2013; Sluik et al., 2012; Wimalawansa, 2013).

The clinical relevance of exercise intervention(s) in treating people with diabetes is well established (Jennings, Vandelanotte, Caperchione, & Mummery, 2014; Montesi, Moscatiello, Malavolti, Marzocchi, & Marchesini, 2013; Wisse et al., 2010). There is a substantial body of literature to support the premise that physical activity improves diabetes outcomes by assisting glucose control and weight management and preventing related complications (Boudreau & Godin, 2014; Brown, Riddell, Macpherson, Canning, & Kuk, 2014; Carson et al., 2014; Desveaux, Beauchamp, Goldstein, & Brooks, 2014; Ferrer, Cruz, Burge, Bayles, & Castilla, 2014; Hu et al., 2014; Huang, Cheng, Tsai, Lee, & Lu, 2014; Montesi

et al., 2013; Schneider et al., 2014), as well as improving an individual's overall health and wellness (Law, How, Ng, & Ng, 2013).

For older people, exercise is an important factor in improving mobility and functional capability, increasing muscle strength and endurance, and optimizing aerobic capacity (Angevaren, Aufdemkampe, Verhaar, Aleman, & Vanhees, 2008). Exercise also assists in reducing pain, building bone mineral density, and improving or maintaining quality of life (Howe, Rochester, Neil, Skelton, & Ballinger, 2012; Stanton, Reaburn, & Happell, 2013). For older people with diabetes, this is even more pertinent because their muscle mass, quality, and strength is significantly reduced (Park et al., 2007; Rahi et al., 2014). The value of exercise, particularly as people age, is clear. However, many older people with diabetes lack commitment to adhere to exercise programs and do not participate in physical activity to a recommended level (Balducci et al., 2014; Jennings et al., 2014; Zanetti et al., 2014). The need for older people with diabetes to be engaged in and committed to exercise, particularly exercise programs that are therapeutic in nature, to manage their diabetes effectively and assist in maintaining muscle mass and strength is essential (Annuzzi et al., 2014; Balducci et al., 2014; Centis et al., 2014).

The challenge of how older people with diabetes can be engaged in and commit to therapeutic exercise and health promotion programs and interventions is clearly outlined in literature (Jennings et al., 2014). The majority of research about older people with diabetes is physiological in nature and does not address the personal implications and reasons for choosing to be involved in exercise. This research sought to address these gaps by seeking to understand how exercise and physical activity in people with diabetes can be promoted and achieved and how these people can commit to maintaining it. Such an understanding can lead to better engagement with this population and their sustained involvement in exercise and health promotion programs.

Diabetes Management, Self-Management, and Maintaining a Healthy Lifestyle

Generally, people with diabetes accept that healthy diet and physical activity are beneficial for maintaining a healthy lifestyle (Centis et al., 2014). If this is so, the question arises as to why the incidence of sedentary behavior is so high for many people with diabetes (Boudreau & Godin, 2014; Centis et al., 2014; Sluik et al., 2012; Wisse et al., 2010). Centis et al. (2014) asserted that people with diabetes find it difficult to commence exercise. In fact, the researchers identified that propensity for changing diet was significantly higher than engagement in regular physical activity, concluding that people with diabetes had low perceptions of the need to increase physical activity to control and manage their diabetes better (Centis et al., 2014). Others have reported similar findings (Centis et al., 2013; Vähäsarja et al., 2012).

An important aspect of diabetes management and maintaining a healthy lifestyle is diabetes self-management. This continuing process of facilitating knowledge, skill, and ability for self-care of diabetes is widely discussed in the literature, guided by evidence-based standards (Funnell et al., 2010; Haas et al., 2014). The theory of diabetes self-management espouses it is necessary for people with diabetes to improve their outcomes by making independent decisions about their disease and associated lifestyle behaviors and how they choose to engage with health care services (Funnell et al., 2010).

The American Diabetes Association (ADA) requires that all people with diabetes receive self-management education at diagnosis and, as needed, later (Haas et al., 2014). The ADA has developed five principles to inform diabetes self-management education: Diabetes education improves clinical outcomes, theoretically based empowerment strategies should be employed, behavioral and psychological strategies improve outcomes in conjunction with age-appropriate group education, ongoing support is essential, and goal setting supports self-management (Haas et al., 2014; Powers et al., 2015). For these principles to be practiced effectively, there are requirements for program structure (both internal and external), access, program coordination, staffing, curriculum, individualization, ongoing support, participant progression, and quality improvement (Powers et al., 2015). The ADA espouses that when these are implemented, the end point will be a more informed and engaged person with diabetes (Powers et al., 2015).

To achieve this desired outcome—an engaged and informed person with diabetes—various models have been implemented with this population, particularly in North America. An example is the Chronic Care Model, a systematic approach to rethinking and arranging medical care to form collaborations between health systems and communities developed to enable people with diabetes self-management skills (Baptista et al., 2016). Stellefson, Dipnarine, and Stopka (2013) undertook a literature review and found the Chronic Care Model to be effective in managing diabetes in the United States. The studies were all focused on people with diabetes between the ages of 50 and 70. Important conclusions outlined that diabetes self-management in chronic care improves physical, psychological, and behavioral outcomes when supported by health care professionals in the community (Stellefson et al., 2013). Stellefson et al. also proposed from their findings in the literature that "more personalized, patient-centered interactions" are helpful (p. 6).

Baptista et al. (2016) also explored the Chronic Care Model using a systematic review. Their findings indicated that clinical outcomes improved with the Chronic Care Model, but were limited when focus was on individual components. They concluded that combining all six components led to greater clinical benefits. This illustrates that models are useful in promoting self-management of diabetes, but also demonstrates a gap in the literature around personal mean-

ing of being involved in programs and how that can influence engagement and personal responsibility for managing the disease.

In practice, diabetes self-management is focused on individual capacity to make behavioral changes (Henderson, Wilson, Roberts, Munt, & Crotty, 2014). To conceptualize the process of intentional behavior change, what is arguably the dominant model of health behavior change must be considered. The transtheoretical model of change (Prochaska & DiClemente, 1983) assesses an individual's readiness to act on a new behavior and provides strategies to guide the individual through the process until he or she has actioned and is able to maintain the change. This established model for change has been used in a number of settings, including adherence to medications, weight management, and smoking cessation. However, it has not been reported in relation to exercise.

Brug et al. (2005) suggested the transtheoretical model is not applicable to physical activity, because of the complexity associated with physical activity. A myriad of aspects surround physical activity, such as transport, work, home life, leisure, and sport. Perceptions of physical activity and its place in a person's life are associated with behaviors and lifestyle. Physical activity cannot be given a "gold standard" (Brug et al., 2005, p. 246), because it will vary for each individual and this individual's capacity and desire. Brug et al. argued that effective and long-term physical activity promotion and sustainability needs to be more than providing health education and incorporating change strategies.

Fritz (2015) stated that people need to change lifestyle behaviors and integrate new tasks into their daily activities, which can be challenging because of life patterns and barriers. When diabetes self-management education is implemented, it produces clinical outcomes, but these positive results seem to diminish after approximately six months (Fritz, 2015). Fritz suggested that people with diabetes only accept aspects of diabetes education and training that fit with their circumstances, and they choose to integrate these into their daily life.

With this in mind, because people will choose to engage in a way that suits them and is congruent with their lifestyle, it is important to have a clear understanding of how individuals choose to engage in and then sustain engagement in health-promoting behaviors in a constantly shifting milieu of personal, physical, and environmental circumstances. It is vital to consider the ongoing shift that occurs in individuals in relation to their disease and their perception of illness and wellness.

Paterson (2001) discussed this movement, or shift, in her Shifting Perspectives Model of Chronic Illness. This is an important consideration of any diabetes management and self-management strategy implementation. As diabetes is a chronic illness, the model is most apposite to consider.

Paterson (2001) proposed that living with chronic illness is a continual process of shifting between perspectives of illness and wellness, depending on context. People may see illness as foremost and have a perspective centered on

"sickness, suffering, loss, and burden associated with living with a chronic illness" (Paterson, 2001, p. 23). Or they may have a perspective of wellness and see their disease "as an opportunity for meaningful change in relationships with the environment and others" (Paterson, 2001, p. 23) and consider self-identity more than the diseased body. This creates appreciation rather than feeling like a victim of the illness. The shift between the two states is dependent, Paterson (2001) said, on whether people feel a sense of control over their disease.

The perspective of chronic illness is not right or wrong, but only reflective of people's needs and situations. Therefore, those involved with people with chronic illness need to listen and not assume, to individualize approaches.

Much literature around self-management of diabetes has shown that social support and connection facilitates better self-management (Henderson et al., 2014; Ku & Kegels, 2015; Luo et al., 2015; Tang, Funnell, Sinco, Spencer, & Heisler, 2015). When social connection was limited or absent, self-management of diabetes was not prioritized or did not occur, even when supported by health professionals (Henderson et al., 2014; Shah, Hwee, Cauch-Dudek, Ng, & Victor, 2015; Tang et al., 2015; Wu & Chang, 2014).

Another factor that has been found to inhibit self-management of diabetes is a lower level of income. A lack of social capital can restrict access to health information and to programs that can supplement self-management strategies (MacKee, 2014; Henderson et al., 2014). This is often associated with being an older person with diabetes. This additional factor of increasing age was identified in the literature as affecting self-management of the disease, with older people being less likely to self-manage and thereby engage in physical activity and healthy eating (O'Neil et al., 2014; Shah et al., 2015). Literature about self-management of diabetes generally suggests that social connections and higher levels of income appear to improve diabetes self-management practice. Knowledge of concepts alone is insufficient to deliver a successful health program (Wu & Chang, 2014). In addition, Majeed-Ariss, Jackson, Knapp, and Cheater (2015) suggested that recognition of the views and needs of people with diabetes is vital for designing and delivering patient-centered care.

It is therefore imperative that we consider that diabetes affects people's lives and how they feel about the disease. Education is available for people with diabetes, but it can be a postcode lottery as to what kind of education people are actually getting about living with diabetes—particularly in Australia, where there is no national, evidence-based structural program (MacKee, 2014). Behavior change has long been recognized as critical in preventing and managing diabetes, but more focus is needed on translational research (Mackee, 2014).

Diabetes and Engagement in Exercise Programs and Interventions

Physical exercise is clearly necessary for people with diabetes to manage their disease effectively and necessary for maintaining muscle mass and strength and for potentially enhancing psychological health. This is especially important because some scholars have reported that older adults' level of exercise is poor and that any level of physical activity decreases with age (Buchman et al., 2014; Chen, Chang, & Lan, 2014; Rydeskog, Frändin, & Hansson Scherman, 2005). Given that exercise is crucial to physical well-being in older people, understanding how to engage this population in ways that are meaningful is essential to ensure active, meaningful, and sustainable participation.

Lack of commitment by people with diabetes in adhering to exercise programs is an issue internationally, not just in Australia (Balducci et al., 2014; Barrett, Plotnikoff, Courneya, & Raine, 2007; Zanetti et al., 2014). However, with supervision from exercise professionals, higher commitment has been attained (Balducci et al., 2014).

Beat It: An Exercise and Health Promotion Program for People With Diabetes

This study was conducted with participants enrolled in an exercise and health promotion program called Beat It. Beat It was established by the Australian Diabetes Council and delivered across Australia by accredited providers. The program (detailed in Figure 1) is an evidence-based exercise and lifestyle education/modification program involving twice weekly individualized physical activity training and fortnightly lifestyle education (disease prevention, treatment, management), nutrition, and goal-setting sessions (Australian Diabetes Council, 2011). The 12-week program was offered to men and women over the age of 18 who were diagnosed with any form of diabetes and who were not working in paid employment. These parameters lent themselves to older people enrolling in the program. All the participants were over the age of 55 and retired.

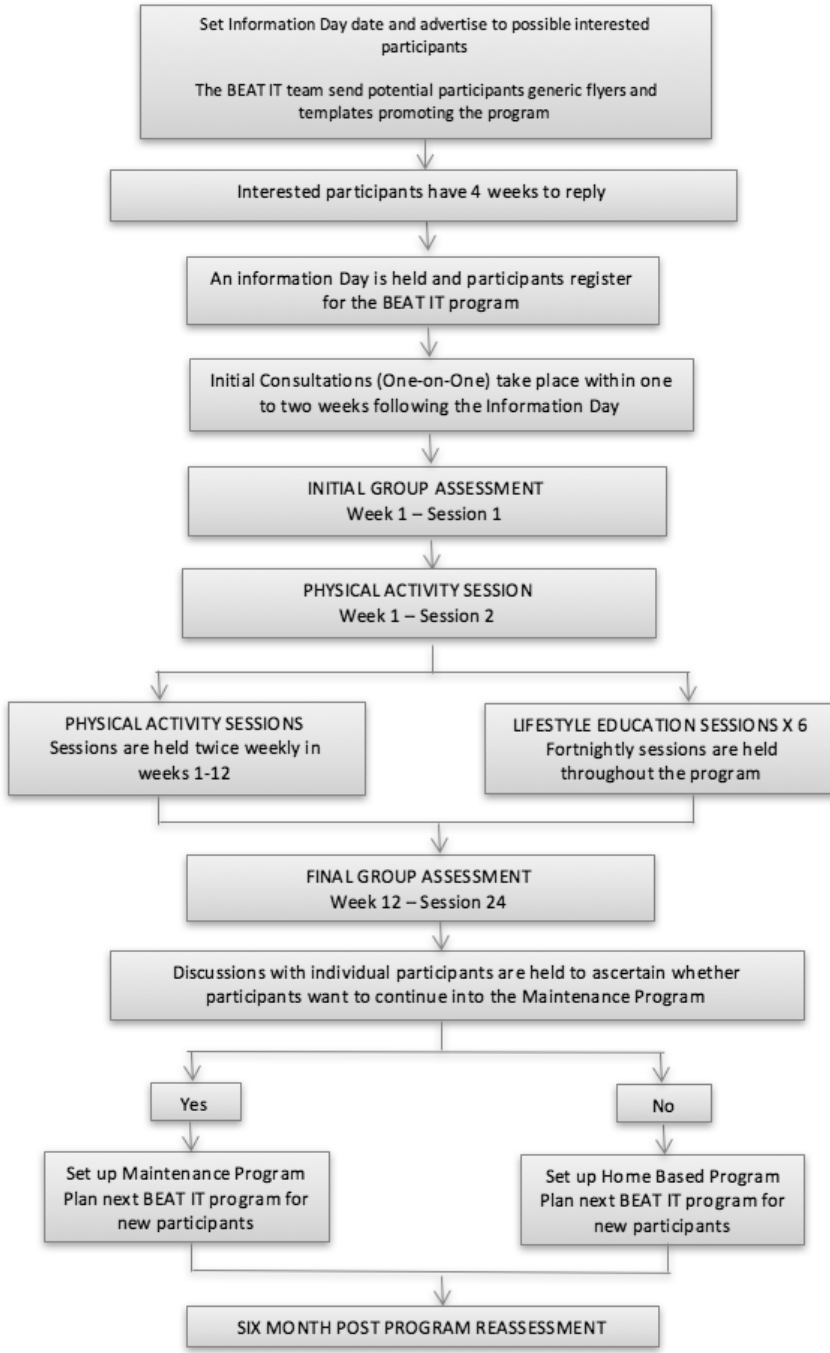

Figure 1. Beat It program implementation flow chart. Adapted from *Beat It: Physical activity and lifestyle program training course manual* (p. 16) by Australian Diabetes Council, 2011, Sydney, Australia: Author.

Participants

Participants were identified from the most recent Beat It program. They were contacted by e-mail and/or mail with an introductory letter, information sheet, and consent form. They were asked to contact the researcher if they wanted to be involved. Fifteen participants expressed interest in being involved and interviewed as part of the research study. Two males and 13 females were interviewed with an age range of 56 to 73 and an average age of 64.

Location

Participants in this study were from the Illawarra region, a coastal community approximately 90 km south of Sydney, NSW, Australia (see Figure 2). According to the National Diabetes Service Scheme, part of Diabetes Australia, 15.6% of the population in the Illawarra region is registered with the Scheme as having diabetes. These rates are higher than the national estimate of 12.3% (Diabetes Australia, 2016).

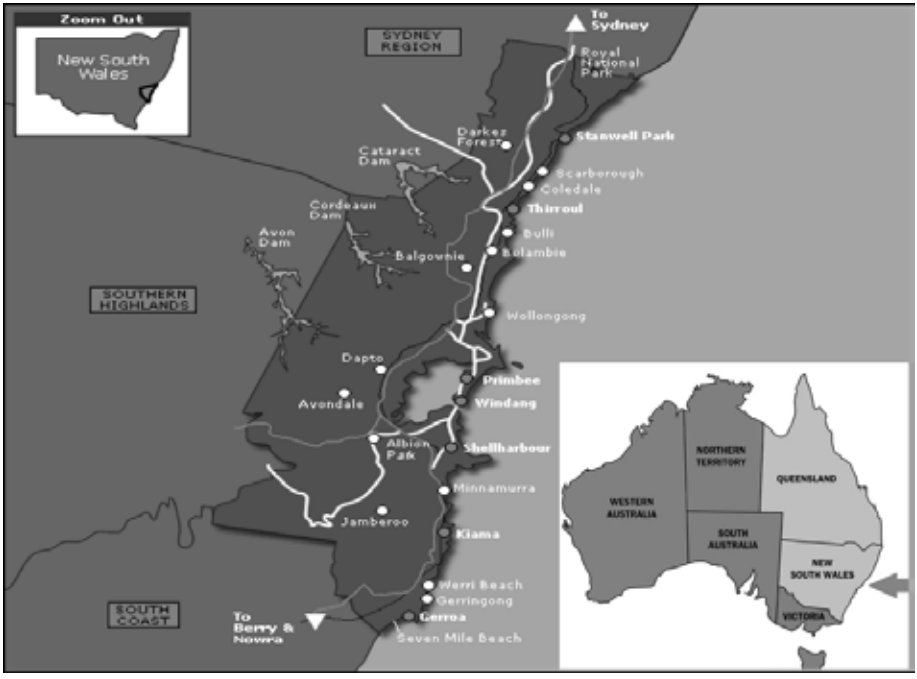

Figure 2. Location map of Illawarra

Research Design

Methodology

The research design used was a qualitative hermeneutic phenomenological methodology. As a means of inquiry, phenomenology is relevant to gaining an understanding of the essence of meaning that people with diabetes attribute to being involved in an exercise and health promotion program. A phenomenological approach facilitates the question of how we as humans experience the world and conceptualize a gamut of phenomena (Crotty, 1996; van Manen, 1990). It is an approach that facilitates an examination about *experience* as understood from the individual's perspective (Grbich, 2013). Phenomenology is subjective, with fundamental characteristics based on the observation that every phenomenon is experienced in individual ways and thus should be understood from the perspective of the individual experiencing it (Berger, 2010; Crotty, 1996; Rydeskog et al., 2005).

Phenomenology as a research methodology seeks to understand and describe the individual's lived experience of a phenomenon (Berger, 2010; Polit & Beck, 2014). This makes it a powerful tool to gain insight into what motivates actions of individuals and how meaning is constructed by the individual within the context and frame of reference of his or her situation (Berger, 2010; Mackey, 2005; Paley, 2013). Participants in phenomenological research must experience the phenomena. For this research, that meant participants had to be part of the exercise and health promotion program (Crotty, 1996). Thus, a purposive sample was necessary.

Method

The design consisted of two phases. First, 15 semistructured interviews were conducted over 2 months with participants who had recently engaged in the exercise and health promotion program Beat It. Two leisure center sites in the Illawarra region had offered the program; participants were from both sites. The participants were aged 56 to 73 years of age (average age 64); two were male and 13 were female. The gender split is not suggestive of any particular reason, other than that more women responded to my invitation to be involved in the research.

The interview questions (see Table 1) guided participants to speak about their lived experience and disclose the meaning they attributed to engaging in Beat It. The sample size of 15 was considered appropriate because smaller numbers of participants can be used in phenomenological research (Giorgi, 1997; Mason, 2010). The purpose of this approach is to elicit richness of data around a specific lived experience that may be transferable, rather than to produce generalizable findings, which are based on a large sample size.

Table 1
Interview Questions and Prompts

Questions
What did it mean for you to be involved in the Beat It program?
Tell me about the reason(s) you decided to be involved in Beat It
What was the purpose of the program overall for you?
What did it mean for you to be involved in a program involving exercise and health promotion?
What do you value from being a part of this program? Why?
Is there anything you would change about the program to make it more meaningful for you?
What is the major thing you got from participating in the program?
Additional prompts
Can you tell me more about that?
How did that make you feel?
What was your experience of that?
I'm interested to hear more about….

Interviews were conducted face-to-face and recorded. Transcripts were prepared by personally transcribing all taped conversations following the interviews, and critical conversations with two senior researchers happened continuously to discuss emerging themes. This enabled the researcher to understand the information gathered and conceptualize a process for analyzing the data. There was a definite sense that nothing new was emerging at the 14th and 15th interviews, so the researcher was satisfied she did not need to interview further.

The second phase consisted of a focus group, conducted after initial analysis of the interview transcripts, to discuss and member check the emerging themes (see Table 2). Invitation was sent by post to participants who had been involved in the interview. An introductory letter, participant information sheet, and consent form were sent. Those able to attend notified the researcher by e-mail or phone. Seven participants agreed to be part of the focus group. Focus groups provide opportunity for collaborative discussions to member check interpretation of previously collected data (Streubert & Carpenter, 2011) and to take back information to participants for confirmation (Charmaz, 2014).

Table 2
Focus Group Questions and Prompts

Questions/Phrases
A theme emerged around the importance of social connectedness with others in the Beat It program. Tell me about your social experience of being a part of Beat It
The instructor was identified as an important part of the program to contributing to meaning for participants in interviews. Can you tell me how the instructor influenced your experience of the Beat It program
Commitment arose as a theme from the interviews. Do you agree that commitment to be involved in the Beat It program was meaningful to you?
Additional prompts
Can you tell me more about that?
How? Why do you think that occurred?
What was your experience of that?
I'm interested to hear more about….
Do others agree with what Joe Bloggs has said? (Why? Why not?)

Ethics

Data were collected only after formal written ethics approval was acquired from the University of Wollongong Human Research Ethics Committee (HE14/057). A plain language information sheet outlining the nature and purpose of the research was provided to potential participants. Participants willing to be involved in the study were asked to contact the researcher.

Data Analysis

Data analysis commenced following completion and transcription of all 15 interviews. Data analysis conformed to van Manen's (1990) six-step methodical structure. This process uses a Heideggerian hermeneutical research methodology and, as such, is faithful to the research design. Van Manen's steps have been used to analyze data from large and small studies of people's lived experience (Armour, Rivaux, & Bell, 2009; Berger, 2010; Cashin, Small, & Solberg, 2008; Chesla, 1995; Miles, Chapman, Francis, & Taylor, 2013) and will be discussed below.

Van Manen's Six-Step Methodical Structure

The approach to data analysis in this research was adapted from the work of van Manen (1990). Van Manen outlines six methodical steps that, although he acknowledges are sequential, have a dynamic movement and interplay between them throughout the research process. An unfolding and infolding occurs as the data is read and reread, considered and reconsidered, examined and

reexamined. There is no beginning or end, no top or bottom to this circular process. Van Manen's (1990) human science approach was used to guide the data analysis. The six steps are outlined in Figure 3.

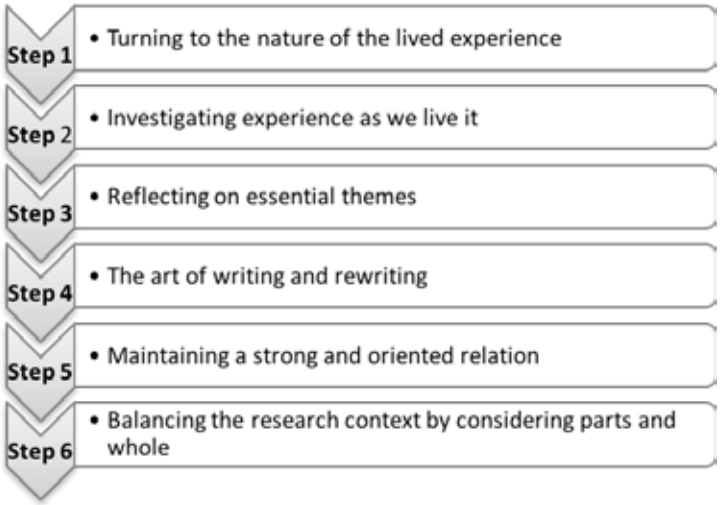

Figure 3. Van Manen's six-step methodical structure.

Step 1, turning to the nature of lived experience, involves formulating a research question and divulging presumptions and understandings based on choosing a phenomenon of interest. Step 2, investigating experience as we live it, involves investigating through the person, not learning through literature, discussions, or other secondhand accounts. Hence in-depth interviews were chosen as an appropriate way of examining the participants' unique experiences.

Step 3, reflecting on essential themes, emphasizes the value of reflectively observing and analyzing phenomenon that can tend to be obscure. This step challenged the researcher to reflect on the themes identified from the interviews and then to highlight the essential meaning of the lived experience in question. Phenomenological research allows the obscure to be brought into focus. This stage of the analysis reflectively questions what actually makes up the nature of the lived experience being studied. This enables consciousness to be revealed and themes to be uncovered.

The art of writing and rewriting is Step 4. This step describes the phenomenon in the process by making visible the feelings, thoughts, and attitudes of participants. By undertaking this step, confluence of language and thoughts occur, being difficult to separate. This process assists in elucidating the phenomenon itself.

Step 5, maintaining a strong and orientated relation, is crucial for the researcher to maintain integrity to and focus on the research question. The final step in the process, Step 6, balancing the research context by considering parts and whole, involves the researcher monitoring the big picture and ensuring that the elements of the research contribute significantly to the whole.

Coding

Coding was used to group and label and then to identify themes through labeling. Coding of the following occurred: themes, theoretical concepts, key words, participant values, interpretations, relationships and states of mind, events and key situations reported by participants, my own views, and metaphors and similar language. NVivo was used to create nodes and assist in developing themes and categories.

Credibility

A validated model was used for data analysis to limit bias and enhance rigor in the research study. Incorporating other researchers (PhD supervisors) into the interpretation of the data served to challenge, question, and confirm the lead researcher's interpretations of the data, minimize bias, and enhance credibility. The credibility of the study was augmented by reading the participants' narratives and examining personal interpretations. The supervisors enriched and substantiated my data interpretations, which also strengthened the credibility of the study.

In addition, the process of writing and rewriting along with ongoing critical dialogue with supervisors strengthened critical reflection. This also contributed to the credibility of the study and served to heighten awareness of any held preconceptions and assumptions. In doing this, the Heideggerian phenomenological approach was maintained.

Findings

Participants described commitment and explained that it was a necessary factor for them to continue to be part of the exercise and health promotion program. They spoke of commitment with terms including *obliged*, *compelled*, *required*, and *owed*. These words describe an intrinsic meaning of commitment posited as "coming from within." Participants did not feel "obliged" to continue as a result of external coercion, but rather they felt "obliged" to themselves, or they "owed it to themselves."

Two categories informed the theme of commitment: *signing up and being part of* and *continuing in and being actively engaged* in the exercise and health promotion program. Figure 4 diagrammatically represents the theme of commitment and the categories and elements that informed it.

Figure 4. Commitment theme and associated categories and elements.

Signing Up for and Being Part of

In interview, participants discussed commitment to the program in terms of how they had signed up for and were now a part of the program. This was a decision they felt they had to honor and were obliged to accommodate. This was evident in comments such as the following: "Well, it meant that I'd committed to something and I needed to keep that commitment. I certainly didn't miss a week if I was at all able to do it" (Participant 5 [P5]). Another participant said,

> It was just that I'm gunna [*sic*] do this because I said I would. And even though sometimes I didn't feel like coming, I did. I think because I agreed to come, I was going to come. There was motivation to come because I agreed to something. When I agree to something, I generally do it. (P6)

The focus group explored the theme of commitment in greater depth. All focus group participants agreed signing up for the program meant committing to come each week. They described their inherent commitment to signing up as a motivating factor driving engagement with the program. Being a part of the program was "non-negotiable," because a commitment had been made. Focus group participants suggested commitment to be a "generational thing". This older population claimed that to finish what they started was a "part of our

generation." This was illustrated in comments such as "Here's the program, I've agreed to do it, so I'm going to do it" (P4), "We've said we will, so we will" (P7), and "Yes, you've made a verbal contract and you're going to stick with this" (P1).

The findings indicated that participants wanted to "honor their commitment to the program." This commitment was made when they agreed to sign up and be part of the program. It appeared to be influenced by their age, as they believed an agreement was made and must therefore be kept.

Continuing in and Being Actively Engaged

Continuing in and being actively engaged had several elements informing this aspect of commitment to the program. Repeatedly in interviews, participants spoke of how their commitment to continuing in the program and being actively involved in it was attributed to the degree to which the program was person centered. Participants frequently talked in interview about how they felt the program was "about me," how they felt the instructors would do things particularly "for me," how they felt the exercise and health promotion was delivered in a way that was "fun for me" and "good and appropriate for me."

The program facilitated an environment that engaged participants and contributed to commitment. Participants noted in interview that they felt instructors tailored the program to them, to their needs and abilities. The personal benefit and individual tailoring was confirmed in the focus group when participants said they felt they were at the center of all interventions and decisions. Participants mentioned that without these facets of person-centeredness, they would not have had the same compulsion to commit to the program, as noted in comments such as the following: "You need [instructor] there or someone of that ilk. I'd have stopped coming if the instructors weren't caring and personal" (P3). Participant P8 said,

> I would like to say again how good the instructors were and how effectively they tailored people's difficulties and disabilities and so on. The other participants likewise were encouraging and helpful to each other. I felt like an individual. You did feel like you got individual attention and understanding.

Participants individually discussed that their commitment was enhanced when personal benefit was apparent. Participants described how experiencing physical and/or psychological benefits through participating in the exercise and health promotion program was encouraging and drove their desire to continue:

> You felt good about it. You could see change. It made me feel good about myself because I had put on muscle and lost weight. I suffer from high blood pressure. Not badly but I reduced my medication to half

> and it's still the same. So that's pretty good. The feeling that I got. You felt good about it. You could see change. For me, it was just finding out that my body could just be young again, in such a short time. (P12)

> The feeling of feeling good about yourself and you weren't feeling good about yourself this morning. I felt relaxed and sometimes you — if you have few worries, you can forget about them for the hour that you're doing the thing and then afterwards, they don't seem so bad. . . . The general feeling of just feeling a bit more bouncy and being able to get through the day more easily. (P13)

Discussion in the focus group confirmed that a sense of personal benefit contributed to continuing in and being actively involved in the program. Personal benefit physically and psychologically was credited as a key factor in maintaining commitment to the program.

Personal benefit was also evident to this group of older people in terms of access and the cost of the program. Because all participants were retired and on a pension (self-funded or government), ease of access and cost were highlighted as influences that affected their commitment to the program, to continuing in it and being actively involved in it. The Beat It program was free for participants meeting the inclusion criteria outlined previously. Participants said, "I've always wanted to go to the gym but could never afford it, being free meant I could go, and I loved every minute of it, loved it" (P13), "They were easy places to go to, easy parking and everything was easy which made it easy to get to" (P15), and "I caught the free bus every week, so it was easy" (P3).

The factors of access and cost were discoursed at length in the focus group as essential in assisting the participants to maintain their commitment to the program, as it enabled involvement in the program that otherwise would not have been able to be afforded. The ease of access including parking availability, leisure center location, and access to the free bus service further enhanced commitment by ensuring no barriers prevented participants from attending.

A sense of community and camaraderie that the participants discussed individually and also in the focus group strengthened the commitment individuals had to actively participating and continuing to attend the program each week. Participants wanted to attend weekly to meet fellow participants, with whom they shared an understanding and had much in common, such as age, life experience, and diabetes. This forged a commitment and desire to continue to support each other and provide encouragement, which motivated them to continue to attend. Participants spoke in interview of these connections as enhancing their desire to commit and be involved each week:

> I really liked the people there so that was an encouragement to keep coming back. The group kind of bonded after a few weeks and people

> talked to each other and told each other their stories and setbacks and steps forward and achievements and accomplishments and, oh crap, I had a cream cake yesterday and that kind of thing. So it was a bonding sort of exercise. (P6)

> Something that's really good with the program is the bulk of the people who did it are people who are similar age. Everyone was doing it at their own pace and if you stopped it wasn't like people were looking at you and singling you out because you're not participating, it just, to me, felt more comfortable . . . because it was like-minded people. (P10)

Commitment was described as easier to keep when treated like an individual and when social connections developed. The sense of community and camaraderie was extensively discussed in the focus group as motivating participants to continue to attend willingly.

Discussion

Participants explained that factors contributing to their ongoing commitment to a health and exercise program were related to *signing up and being part of* and *continuing in and being actively engaged*. They explained that a person-centered approach not only was important, but also prompted their ongoing commitment and active engagement in the program

Signing Up and Being a Part of the Program

Participants spoke of needing to "honor" the decision to attend and how they were motivated to attend because they had "agreed to something." Participants regularly referred to the "commitment" they had made and how they did not miss classes unless they "had a bloody good reason." They explained this as "the way [we] do things." Even when they did not feel like attending, they would still do so because "the commitment was there," even if that meant "forcing" themselves to attend. Participants seemed to assert that it was their generational value of honoring their word that influenced their decision to commit and *sign up and be part of* the program. They claimed it was an inherent part of being an older generation that they kept their word.

In the focus group, participants described this as being related to "their generation," when "verbal contracts" meant something. Deal (2007) identified that older generations of people believe they are hardworking and consider younger generations as having less work ethic and hence lower levels of commitment to complete processes. Henry (2015) added that older people have been described as being more concerned with process than results, and they are portrayed as having a strong sense of loyalty. In this study, participants' loyalty was their commitment to the program, and this loyalty was also a motivating factor to continue in and be actively involved in the program.

Continuing in and Being Actively Engaged in the Program

Three aspects of being actively engaged and therefore continuing in the program were identified: being treated as an individual and in a person-centered way, personal benefits, and connectedness, which involves social connection.

All participants spoke of the person-centered way they were treated during the program and how valuable that was to them. They felt like individuals. Participants felt strong commitment to the program when they encountered individual tailoring—when they felt they were the center of the program and perceived it met their needs. Muller-Riemenschneider, Reinhold, Nocon, and Willich (2008) support this concept with older adults, stating that a tailored approach, with personal contact, promotes individuals' development of long-term patterns of physical activity and associated behaviors as well as accountability and commitment to the group and the program. Balducci et al. (2014) suggested that tailored programs are critical to helping improve functional status in older adults and that benefits can be more targeted to individual needs when participant commitment is evident.

It appeared that participants found that individualization and choice were important. They appreciated structure and direction, which the program gave, but felt that individual allowances were incorporated into each session. These allowances were tailored to each person according to disease or age-related barriers they may have been facing, and they further contributed to commitment to the program (Balducci et al., 2014; Valencia, Stoutenberg, & Florez, 2014).

Being treated as an individual and in a person-centered way is underpinned by the values and philosophies of "empathy, dignity, autonomy, respect, choice, transparency, and desire to help individuals lead the life they want" (Reid-Searl, Levett-Jones, Cooper, & Happell, 2014, p. 486). Person-centeredness focuses on the uniqueness of the individual and hence the importance of customizing service delivery to the needs and requests of the person, supporting the person's rights, values, and beliefs with the intention of maximizing the person's potential (Moyle, Parker, & Bramble, 2014). The strengths-based approach of the program moved attention to the people and their abilities, focusing on the fact that individuals have strengths that can be used and developed to promote ownership of their own health, care, or service delivery and contribute to improving their quality of life (Moyle et al., 2014; Xie, 2013). This is important when considering older people with diabetes who are able to contribute to improving their quality of life when involved in exercise and health promotion through empowerment and self-efficacy (Gottlieb, 2014). These factors encourage commitment to a program and were evident in this research study.

In this research, commitment to the program was fortified when the individual needs of participants were met in a person-centered manner. It was also encouraged when they could see and feel personal benefits.

Personal benefits to the participants are necessary to continue in and be actively engaged in a program. Participants described benefits as biophysical and/or psychological. Ease of access was also described as a personal benefit that helped them commit to the program.

All participants described positive biophysical benefits such as changes to body shape or decreased blood glucose levels. Experiencing biophysical benefits, and ultimately tangible improvements in health, reinforced participants' commitment to the program. Physical activity is beneficial for healthy aging (Young, Angevaren, Rusted, & Tabet, 2015), enabling an individual to grow older in good health with independence in daily living and interacting within society (Murtagh, Murphy, Murphy, Woods, & Lane, 2014). Multiple studies have demonstrated that regular exercise in older people with diabetes leads to significant improvements in physical functioning (Apostolopoulos, Borkoles, Polman, & Stojanovska, 2014; Balducci et al., 2014; Ferriolli, Pessanha, & Marchesi, 2014; National Institute for Health and Care Excellence, 2014; Patil et al., 2015; Wozniak, Soprovich, Mundt, Johnson, & Johnson, 2015). When older people with diabetes see physical benefits from exercise, they are more likely to be motivated to continue (Lascar et al., 2014). Physical results identified by participants in this research encouraged their ongoing commitment and for them to exercise more seriously. The older person with diabetes' physical experience during exercise and then the ensuing results were important in terms of making sustainable lifestyle changes (Toft & Uhrenfeldt, 2014). Merleau-Ponty, a prominent phenomenologist from the 20th century, stated that the lived body is habitual (van Manen, 2014) and hence physical benefits drive ongoing motivation and commitment.

Psychological benefits, in the form of personal emotional well-being, were often described by participants and repeatedly voiced as key to being involved in the program. Psychological benefits are inclusive of emotional and mental benefits that participants identified. Positive feelings and enhanced positivity were spoken about by participants as emotional benefits. Improvements in clarity and thinking were described by participants as mental benefits. Delaney, Crandell, and Barfield (2014) found in their research that noncompetitive exercise–based therapeutic programs can enhance the mood and the self-confidence participants experience as they undertake an exercise and health promotion program. Additionally, Ferriolli et al. (2014) and Skov-Ettrup, Petersen, Curtis, and Lykke (2014) discovered in their research that self-esteem and perceived quality of life were enhanced during health promotion program participation.

Participants spoke of how being a part of the program made them feel good about themselves. They verbalized that they felt "so much better about myself." This then led to coming "along the next time," as "doubt" was left be-

hind and "positivity" replaced it. This was a key factor in their commitment to continuing in the program and being actively engaged.

According to Hebblethwaite (2013) and Song and Kong (2015), feelings associated with increased well-being and improved self-determination and coping contribute to successful and healthy aging in older people. Acceptance of self, coping with illness (diabetes), and adapting to undertaking the program while feeling in control led participants to speak about how they felt more positive during the program and hence wanted to continue attending. This concept is discussed in literature as realistic optimism (Song & Kong, 2015) and enables older people to adapt and continue to experience good health (Ebrahimi, Wilhelmson, Moore, & Jakobsson, 2012; From, Johansson, & Athlin, 2007).

When older people with chronic diseases (diabetes being one) are more physically active, there is a higher incidence of positive thoughts (Guicciardi et al., 2014). This is particularly connected to their diabetes management and consequently their commitment to continuing in and engaging in a program (Gallagher, Zelestis, Hollams, Denney-Wilson, & Kirkness, 2014).

Another contributor to committing to continuing in and engaging in the program was ease of access to the exercise and health promotion program. Participants valued the accessibility of the program and noted that there being no associated cost was particularly important. Close and easy parking and access to public transport and the program environment were significant to commitment. Van Stralen, De Vries, Mudde, Bolman, and Lechner (2009) confirmed that access is an important consideration in an older person's decision to choose an exercise program and maintain commitment to it.

Participants described difficulty in maintaining exercise and healthy eating when there was not the same level of "support" and "feedback" they had received in the program. This was associated with cost, but also with motivation to continue without the ongoing support they had received and valued throughout the program. In relation to the participants maintaining levels of exercise after the program concluded, only one continued to engage in the leisure center activities for older people. Participants lamented that they were not able to continue, with all reasons centered on cost and the inability to afford to pay for programs or membership. In the focus group discussion, participants explained: "I wouldn't have been [able to be] here apart from that [free program]" (P1).

Others reiterated the point of inaccessibility to continue once payment was required: "As I said I loved every minute of it, loved it. If I can afford I will be going back. I've actually thought of hinting to my daughter that she can give it to me for a mother's day present" (P13). Another participant said, "Now I've just gone back to walking again because like probably a lot of people in the same situation as me, we can't afford to join a program. I was sorry when it ended" (P9).

Connectedness was the third aspect that reinforced commitment to continuing in and engaging in the program. Participants acknowledged that they shared a sense of community and connectedness to each other. Fun and camaraderie, which are important aspects of connectedness because humans need these in their social relationships (Hebblethwaite, 2013), were offered as affordances of the program and emerged as important contributors to participants committing to the program. This finding is reflective of Skov-Ettrup et al. (2014) findings that fun and camaraderie are integral to older adults entering and remaining in an exercise program. Further, the fact that all participants were from the same generation, had a shared disease, and had reasonably homogeneous life experiences contributed to a level of perceived comfort, safety, and connectedness. Participants described this as contributing to a meaningful and fun experience. Participants discussed how they enjoyed getting to know the other participants and spending time with them. This, they said, facilitated commitment to attending the program as time went on, essentially so they could connect with others and feel like they belonged. This got stronger as the program continued: "I looked forward to seeing people" (P14).

Older people desire social engagement and as such, Stumbo et al. (2015) said, seek opportunities to be involved with others. The social aspect of a health promotion program is attractive to this population, and this sense of connectedness often means more than the actual exercise component (Johnston, Irving, Mill, Rowan, & Liddy, 2012). To have fun and be with others is an instigator and motivator to continuing in and engaging in a program (Skov-Ettrup et al., 2014). Finding connection with others in a program allows for promotion of health in older people living in the community and thereby improves a leisure lifestyle (Fogarty, Farrell, & Gutmanis, 2014).

In this research, participants described how the instructor created a sense of connectedness—individualizing and focusing on people rather than on the program. They were treated in a person-centered way, making them feel valued. This contributed to wanting to continue to attend and engage in the program. Van Stralen et al. (2009) found that the effect of the instructor was key in helping participants maintain commitment to an exercise program. Participants also reported the connection with the instructor was a factor in their commitment to the program.

Implications and Future Research

When participants are treated as an individual and in a person-centered way, when they see personal benefits and find connectedness, change occurs. Program efficacy was achieved when participants with diabetes felt they were able to contribute to improving their quality of life when involved in an exercise and health promotion program. Empowerment and self-efficacy, in whatever

capacity or meaning that had to the person, led to commitment and engagement in the program.

All participants spoke of the person-centered way they were treated during the program and how valuable that was to them. They felt like individuals. A key characteristic of person-centeredness is relationship, when the individual feels empowered and finds meaning in the interaction (Jacobs, 2015). When support is present in such programs, self-efficacy is increased and management of diabetes improves, including meeting recommended exercise guidelines (Hu et al., 2014; Strom Williams, Walker, Lynch, Voronca, & Egede, 2015).

It is clear that programs such as Beat It can play a meaningful and important role in dealing with diabetes and how to surmount associated difficulties of the chronic disease. Such programs are associated with working with and enabling the "whole person" (Carruthers & Hood, 2007, p. 276), focusing on ability to build on personal strengths and thereby enhance positive emotion and capacity (Stumbo et al., 2015).

Considerations for future programs and people with diabetes encompass the findings that people will engage more with programs if they are individualized and enable choice. Future research should be undertaken to explore aspects of why and how commitment is made to health promotion programs by people with diabetes and other chronic health diseases. This would be important in discovering why participants engage in such programs.

It would be useful to conduct a large-scale study that would enable more generalizability of findings. Another direction for future research would be to investigate the long-term implications of health effects and benefits for people with diabetes who engage in exercise and health promotion programs. A longitudinal study of these outcomes could inform financial implications associated with being a part of a program.

Conclusion

For older people with diabetes undertaking exercise and health promotion programs such as Beat It, it is essential that commitment to personal health is established and maintained. How this is achieved is different for different people. However, this research has demonstrated that commitment to *sign up and be a part of* and *continue in and be actively engaged* in a program will be enhanced in older people with diabetes when particular aspects are fortified within the program:

- When programs are designed for homogeneous groups in terms of age and disease processes, participants are likely to sign up for the program and then commit as they have common grounds to build upon.
- When programs are person-centered and can individualize effectively, then older people with diabetes will see value and want to sign up and continue to engage.

- When programs enable personal benefits to be seen and felt in a real and purposive way—be it physical and/or psychological— participants will experience commitment to ongoing engagement in the program.
- When programs allow participants to connect with each other and form relationships, the individual feels empowered and finds meaning in the interaction (Jacobs, 2015), and they are then more likely to continue to engage and commit to the program.

These factors are critical to understanding an older person with diabetes's commitment to signing up for and then continuing to engage actively in a program. Many older people with diabetes do not follow recommended guidelines for exercise or nutritional eating. This can be partly attributed to inadequate support for such activities and can also be due to ineffective programs for older people with diabetes (Wozniak et al., 2015). Because diabetes is a chronic disease that necessitates lifelong engagement in and commitment to healthy living to augment health and well-being (ADA, 2016; Linmans, Knottnerus, & Spigt, 2015), older people with diabetes must have an audible voice, a voice that is heard and listened to (McQueen, 2015), acknowledged, and incorporated into structuring and planning programs. The factors above can help to inform the effective design and construction of other exercise and health promotion programs to assist older individuals with diabetes to establish patterns of exercise and good health routines.

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- All materials must be double-spaced on 8.5 × 11-in. (or 22 × 28 cm) pages.
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  - Times or Times New Roman, pt. size 12.
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  - Only the title should appear on the manuscript itself. The title should appear at the top of the first page, followed by the abstract, and then the body of the manuscript.

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Practice Perspectives Guidelines

The focus of the Practice Perspectives is to embrace ways of knowing about the field of health education and promotion experience and the facilitation of service delivery in both participant relationships and clinical, administrative, and interdisciplinary contexts. This section has been expanded to invite two distinct components:

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