

## Barriers and facilitators of weight management: perspectives of Arab women at risk for type 2 diabetes

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### Abstract

Obesity and associated chronic diseases, such as type 2 diabetes, are highly prevalent in the United Arab Emirates (UAE). This qualitative study explored weight management behaviours and perceptions of women who are at increased risk for type 2 diabetes through focus group interviews. A total of 75 Emirati national women (age, 20–60 years) considered high risk for type 2 diabetes participated in eight focus groups. Purposive sampling was used to recruit women from primary healthcare centres (PHCs) in Al Ain, UAE. Qualitative research methodology involving a modified approach to grounded theory was used to guide data collection and analysis. Focus group interviews transcripts were thematically analyzed using NVivo software. A number of personal, social and physical environmental themes emerged as both barriers and enablers that are consistent with the social ecological model of health promotion. Low motivation, lack of social support, competing demands, lack of culturally-sensitive exercise facilities and sociocultural norms that restrict outdoor physical activities were the main barriers cited by the participants. On the other hand, social support, such as having other women to walk with, helped them stay physically active. Suggestions from the participants included enhancing social support for women, greater access to dietitians and nutrition information, and increasing availability of culturally-sensitive exercise facilities. This study provides valuable information in the development of culturally congruent healthy weight promotion programmes for women at risk for type 2 diabetes in the UAE and has implications for obesity intervention programmes for women in other Arabian Gulf countries.

**Keywords:** Emirati women, focus group interviews, type 2 diabetes prevention, United Arab Emirates, weight management

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### Introduction

The United Arab Emirates (UAE), a country located in the eastern part of the Arabian Peninsula, has witnessed significant rapid economic development within the past three decades, mainly due to oil revenues. This economic growth has been accompanied by major changes in lifestyle involving diet and physical activity, leading to high prevalence of obesity and non-communicable diseases,

such as diabetes and cardiovascular diseases (Department of Preventive Medicine 2006). A nationwide study reported that nearly 25% of Emirati adults have type 2 diabetes and three-quarters of UAE residents are either overweight or obese (Malik *et al.* 2005). Population groups that are at increased risk for type 2 diabetes include persons with elevated fasting or postload glucose concentrations, those with abdominal obesity, as well as women with history of gestational diabetes

(Canadian Diabetes Association 2008). These high-risk subgroups should be the main targets of diabetes prevention programmes.

A number of factors that increase risk for type 2 diabetes have been found to be highly prevalent among Emirati national women, including obesity (Musaiger & Radwan 1995, Carter *et al.* 2004, Baynouna *et al.* 2008), history of gestational diabetes (Agrawal *et al.* 2005) and pre-diabetes (Malik *et al.* 2005, Saadi *et al.* 2007). Studies have also found that compared with men, Emirati women have higher prevalence of obesity (46.5% vs. 28.3%) (Baynouna *et al.* 2008) and pre-diabetes (20.6% vs. 15.6%) (Malik *et al.* 2005).

Large-scale, randomised multi-centre trials have shown that type 2 diabetes can be prevented (up to 58%) through lifestyle modifications including diet and increased physical activity that result in a modest weight loss of 5 to 7% of the initial body weight [Tuomilehto *et al.* 2001, Diabetes Program Prevention research Group (DPP) 2003]. However, weight management is influenced by many factors, including social and behavioural factors that are often different across groups and cultures (Ajzen & Fishbein 1980, D' Eramo Melkus 1997). Despite the high prevalence of obesity, data regarding barriers to weight management among Emirati women are limited. A recent study that explored the perspectives of physicians, nurses and dietitians working in primary healthcare centres (PHCs) identified a number of barriers and solutions to weight management among Emirati women (Ali *et al.* 2009). However, the extent these views are consistent with those of Emirati women themselves has not been examined.

Qualitative research methods such as focus groups are useful in gaining insight into the attitudes and perceptions of a target group and have the potential to identify both behavioural and social factors related to weight management among Emirati women. Focus groups are useful in exploring opinions, group norms and cultural values in a small group setting and enable participants to generate ideas, explore their own questions and develop their own analysis of common experience (Krueger 1994, Kitinger 1995). Focus groups have been successfully conducted with Emirati women to identify their healthcare needs (Winslow *et al.* 2002, Winslow & Honein 2007) and to obtain information related to social, environmental and personal aspects of breast cancer and breast cancer screening practices among UAE women (Bener *et al.* 2002). The purpose of this study was to explore barriers and enablers to weight management of women at risk for type 2 diabetes within the cultural context of the UAE to inform in the development of future culturally congruent healthy weight promotion programmes.

## Methods

### Study design

Qualitative research methods were deemed to be the most appropriate to allow themes to emerge due to the limited knowledge available on this topic. We used a modified grounded theory approach to guide data collection and analysis (Cutcliffe 2005). A modified grounded theory approach involves the use of defined research questions or hypotheses while retaining the key features of grounded theory features, such as iterative nature of data collection and analysis and data saturation (Glaser & Strauss 1967, Strauss & Corbin 1990, Creswell 1998). Our study was designed to address three broad questions: (1) What are the attitudes of Emirati women at risk for type 2 diabetes mellitus towards weight management?; (2) What factors do Emirati women perceive as barriers to weight reduction and maintenance of a healthy weight?; and (3) What suggestions do Emirati women have in the development of intervention programmes to promote healthier weights? The study was conducted in the PHCs affiliated with the Al Ain Medical District, Al Ain, UAE. Al Ain Medical District has 19 urban and semi-rural PHC centres providing comprehensive healthcare services to a national and expatriate population of approximately 400 000.

### Data collection

Following approval from the Al Ain Medical District Human Research Ethics Committee, a letter explaining the purpose and participant inclusion criteria was sent to PHCs in Al Ain Medical District that serve predominantly Emirati citizens. Purposive sampling strategy (Mays & Pope 2000) was used to recruit participants. Doctors in the selected health centres invited Emirati national women, 18 years of age and older with no previous diagnosis of diabetes (except gestational diabetes) to participate in the focus groups if they met one or more of the eligibility criteria: (1) History of gestational diabetes; (2) Abdominal obesity (waist circumference >88 cm) plus family history of type 2 diabetes or (3) Pre-diabetes (fasting plasma glucose 100–125 mg dL<sup>-1</sup> or 140–<200 mg dL<sup>-1</sup> after 75-g glucose load). Consideration was given to seek diversity within the target population (i.e. inclusion of women with previous gestational diabetes, pre-diabetes, abdominal obesity and family history of type 2 diabetes). The majority of the women approached agreed to participate. Those who agreed received a reminder phone call 1–2 days before the focus group meeting. The overall focus group attendance was 70–80%. Main reasons given for non-participation were transportation and other family responsibilities.

A focus group discussion guide was developed by the research team and was pre-tested with five women to explore the feasibility of successfully conducting a focus group with Emirati women in a PHC setting. Topics included perceptions about current body weights, barriers to healthier body weights and programmes/activities needed for weight management in Emirati women. Based on this feedback, the focus group duration was restricted to a period not exceeding 1½ hours, including the time required for signing the consent forms and collecting participant demographic data.

Eight focus groups were conducted from May to December 2007 in PHCs in the Al Ain Medical District: two urban, four suburban and two semi-rural to include the views of women from various backgrounds. Urban centres are centres within the city of Al Ain while suburban areas are located 20 to 30 km from the city. The semi-rural centres are at least 40 km from the city. More focus group meetings were held in the suburban PHCs as more UAE nationals live in these areas. Focus groups were scheduled in the morning or evening following consultations with potential participants. Meetings were held in comfortable meeting rooms located in the participating health centres. Before the start of the focus group, participants signed a written consent form in Arabic, including the use of audio recording. Height, weight and waist circumference were measured using standard procedures (Lau *et al.* 2007). Body fat content was determined by bioelectric impedance using a portable Tanita Body Fat Monitor/Scale (TBF-531; Tanita, Tokyo, Japan) following the manufacturer's instructions. Each focus group was conducted by two Emirati nurses trained in focus group facilitation (one acted as a facilitator and the other as an observer or note-taker) to create an environment conducive to ease in communication and acceptance with the participants. They were selected because of their focus group research experience, cultural and language competence and enthusiasm to participate in the research project.

The sessions began with the facilitator introducing herself, explaining the purpose of the meeting and assured confidentiality of the information shared. The facilitator encouraged participation of all members in the discussions using open-ended questions and probes when necessary. Interview questions were modified as the study progressed to seek further clarifications. Focus groups ranged from 5 (Group 5) to 13 (Group 8) participants and lasted between 45 and 60 minutes. At the completion of each session, there was a debriefing between moderator, observer and the principal investigator to discuss the most important ideas that emerged and possible differences with other previous focus groups. After eight focus group interviews, no new data

were collected, which indicated topic saturation, and the focus groups were then concluded.

### Data analysis

Original tapes were transcribed in Arabic and translated into English by the observer who attended the meeting. The session facilitator then reviewed the transcribed notes and checked the English translations against the Arabic tapes. The principal investigator read the observer notes and the English translations of the tapes. In addition, one of the authors (LB), an Emirati national, reviewed the English translations of three of the focus group interview tapes against the English translations.

Qualitative methods were used for data analysis. English translations together with the observer notes were imported into the Nvivo software for analysis (Nvivo 7.0; QSR International, PTY, Ltd., Doncaster, Victoria, Australia, 2006) to facilitate data management and analysis. As the interviews progressed, one of the authors (HA) analyzed the data from each focus group to inform the subsequent interviews by developing the preliminary codes and identifying important ideas, which were used to refine some of the interview questions. The constant comparison method (Strauss & Corbin 1990) in which each item is checked or compared with the rest of the data was used. Transcripts were carefully read and data with similar content were grouped together to develop the preliminary categories (free nodes). Free nodes were examined for interrelationships and organised into categories (tree nodes). Tree nodes were then systematically compared, grouped into themes and examined for interrelationships to develop the conceptual framework representing the data. The other two authors independently reviewed the coding assignment of the data and commented on the appropriateness of the coding categories and the emerging themes. Differences were resolved through discussion and consensus. All three authors contributed to the development of the conceptual framework emerging from the data.

### Data trustworthiness

A number of qualitative research rigour measures were employed, including credibility, authenticity and confirmability (Mays & Pope 2000, Whitemore *et al.* 2001, Fade 2003) to ensure data trustworthiness. To ensure an accurate recording of the participant responses, focus groups were audiotaped, transcribed verbatim and translations were subjected to independent reviews (credibility). Data confirmability was achieved through independent reviews and consensus of the coding scheme by the research team. The authenticity of the results is supported by participant quotes.

## Results

A total of 75 women attended one of the eight focus groups held in PHCs in Al Ain Medical District. Women attending urban, suburban & semi-rural PHCs were included to maximise variations in experience related to weight management. Table 1 shows the demographic characteristics of the focus group participants. Subjects' ages ranged from 20–60 years, with a mean age of 39 years and a median age of 40 years. The majority of the women were from health centres located in the Al Ain suburb and only 25% were within healthy weight. The five main themes that emerged from the study were: barriers, enablers, perceptions, behaviours and suggestions.

### Barriers to weight management

Women who attended the focus groups were generally aware of the importance of weight management in keeping healthy. Various consequences of excess body weight were expressed. However, almost all agreed that it was difficult to adopt lifestyle behaviours (diet and exercise) consistent with their healthcare professionals' advice due to many barriers in their daily lives. These factors were classified into personal barriers, social–environmental barriers and physical environmental barriers (Table 2, Figure 1). Personal barriers included difficulty in controlling appetite, lack of knowledge on nutrition and healthy food preparation methods, and the loss of motivation to continue with weight management efforts when weight loss was not achieved. Competing demands such as housework and childcare responsibilities decreased women's engagement in regular physical activity. Women with chronic medical conditions, such as asthma and heart disease discussed how these diseases have reduced their physical activity levels. One participant

**Table 1** Focus group participant characteristics ( $N = 75$ )

Demographic variable	
Age (mean $\pm$ SD)	39.1 $\pm$ 12.1
Waist circumference (mean $\pm$ SD)	99.1 $\pm$ 14.9
% Body fat* (mean $\pm$ SD)	37.8 $\pm$ 8.0
BMI Category (%)	
Normal weight (18.5–24.9)	25.3
Overweight (25.0–29.9)	30.7
Obese (30.0–39.9)	30.7
Morbidly obese ( $\geq$ 40)	13.3
Living area (%)	
Urban (Group 5, 6)	17.4
Suburban (Group 1, 2, 7, 8)	53.3
Semi-rural (Group 3, 4)	29.3

\* $N = 74$

mentioned that Internet use limits the available time for exercise.

Social environmental barriers such as low social support from families interfered with weight management. Participants discussed how they do not have enough space to do in-door exercise in their houses and that there are sociocultural norms that limit outdoor exercises, such as their families not allowing them to walk outside alone and frequent social gatherings (guests and invitations) that promote overeating. Furthermore, time constraints due to social obligations (family visits) also decreased women's engagement in regular physical

**Table 2** Barriers to weight management – sample participant quotes and health centre setting\*

#### Personal barriers

**Appetite:** "I am not exercising and I cannot control my diet because whenever I see food I want to eat" (Group 6, urban)

**Low nutrition awareness:** "The food we eat is not healthy because of the way we cook it and because we do not know enough about healthy food" (Group 3, semi-rural)

**Low motivation:** "Sometimes I feel bored and depressed, when I try to reduce weight by eating less and exercise I see that there is no change in my weight so I feel depressed and I will stop everything and spend most of my time using the computer and internet especially after I finished university I noticed my weight increased more" (Group 8, suburban)

**Competing demands/lack of time:** "There is no time because there is a lot of housework" (Group 7, suburb)  
"Sometimes appetite, we can't prevent ourselves from eating; sometimes children are at home so no time to exercise" (Group 6, urban)

"For me, computer and Internet; I spend a lot of time using it and so there is no time for exercise" (Group 7, suburban)

**Medical condition:** "I am not happy, I feel I am too fat and that my weight is supposed to be less than this. I cannot move a lot because I had a stroke and so I cannot walk or do any exercise and this is why I gained weight" (Group 2, suburban, BMI: 32.5)

#### Social environmental barriers

**Sociocultural norms:** "Walking is not culturally acceptable. My husband will not allow me to walk in the street but if it is a closed place [gym] he has no problem" (Group 1, suburban)

"We try to eat healthy food at home but when we visit our relatives and friends they get upset if we don't eat everything they put on the table" (Group 1, suburban)

**Low social support:** "My family won't encourage me; for example if I want to bring a walking machine they say there is no place to keep it" (Group 8, suburban)

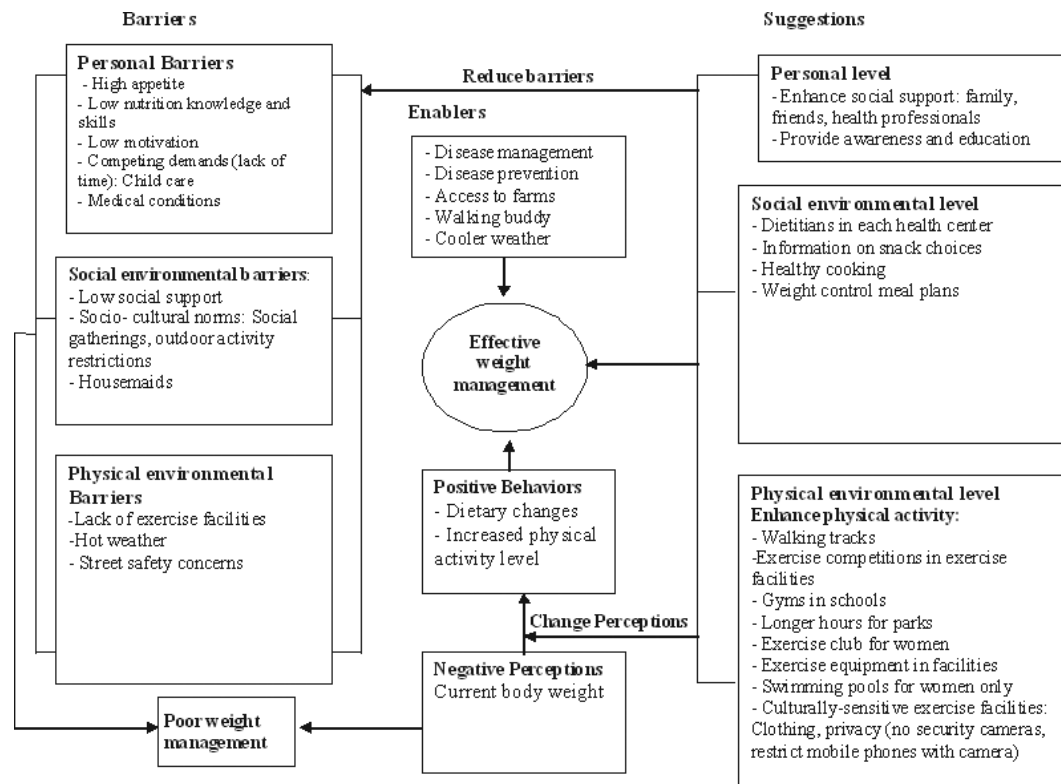
**Housemaids:** "Our weights increase because we have housemaids and we depend on them a lot" (Group 1, suburban)

#### Physical environmental barriers

**Lack of exercise facilities:** "Changing diet alone without exercise will not help lose weight and there are no places to do exercise" (Group 2, suburb)

**Weather:** "When the weather is cold I walk, but it is difficult to walk in summer" (Group 2, suburb)

\*Body Mass Index (BMI) is included for some participants.



**Figure 1** Conceptual framework of weight management barriers and facilitators among Emirati women derived from focus groups with Emirati women at risk for type 2 diabetes.

activities. Some of the women felt that having housemaids contributed to their weight increase because the housemaids prepare family foods and decrease the women's physical activity levels by performing household activities, such as cleaning.

Many of the participants mentioned the lack of culturally appropriate exercise facilities for women as a physical environmental barrier to weight management and how it is difficult to exercise without these facilities. Some of the participants mentioned the hot weather conditions in the UAE as a major barrier for outdoor exercise, while few of them raised the issue of safety concerns for women walking alone in the streets, especially at night.

### Enablers of weight management

For participants in the study, medical diagnosis such as hypertension was a frequent motivator for starting to exercise:

... (I am motivated to exercise) because of diseases, and (knowing that) a healthy weight is a healthy body... I get tired (too) while praying." (Group 5, urban). Another participant added: "I am not too fat but I still want to reduce my body weight to prevent diseases. (Group 1, suburban)

One of the women who attended one of the focus groups held in the semi-rural health centres said:

I tried walking and it was easy for us because we have a farm. (Group 3, semi-rural).

Joining an exercise facility also helped some of the women to lose weight:

...a club. I joined one for three months and it was very useful, I lost a lot of weight but, when I got pregnant with my daughter I gained it again. (Group 2, suburban).

Most of the women agreed that they prefer walking with other women; they feel safer and more comfortable:

I feel group walking is good, I feel safe and comfortable and time passes very quickly, sometimes we walk for 2–3 h and we enjoy it. (Group 7, suburban).

Cooler weather allowed women to walk more often:

When the weather is cold I walk, but it is difficult to walk in summer. (Group 2, suburban)

### Perceptions related to weight management

Women who attended the focus group meetings discussed perceptions on their body weight, perceptions of

a healthy diet for weight management and the implications of obesity on health.

#### *Feelings about current body weight*

Few of the women were satisfied with their current weight and most of them wanted to lose weight. Some of them considered a weight is healthy if it is appropriate for height, while others thought it should be 60 kg for women:

My healthy weight is the weight which is acceptable for my height (Group 3, semi-rural)

The healthy weight for any women should be 60 kg (Group 3, semi-rural)

Some participants felt their weights were appropriate for their height even though they were overweight or obese:

I feel my body weight is suitable for my height but I still need to lose at least 3 kg (Group 1, suburban, BMI: 35.5)

Few of the women did not want to decrease their weight even though they were overweight:

I feel heavy [fat] but I do not want to reduce my weight (Group 2, suburban, BMI: 27.0)

One woman in focus group 3 wanted to gain weight although she was obese:

I want to gain a little weight (rural, BMI: 37.0)

#### *Healthy diet*

Participants generally considered a diet is healthy if it contains little meat and fat and is high in fruits and vegetables:

I am exercising and eating healthy food. I eat more fruits and vegetables. I increase my fluid intake and I decrease my fat and meat intake but step by step (Group 4, semi-rural)

#### *Excess weight causes diseases, interferes with daily activities*

Participants generally agreed that excess body weight poses health problems. For example, in response to a question why healthcare professionals advise keeping a healthy weight, one woman said:

It [high body weight] will cause joint pain so we cannot walk, it will also cause heart disease (Group 2, suburban, BMI: 26.2)

Before I did not have hypertension but now because of my weight I have high blood pressure and cholesterol levels (Group 5, urban, BMI: 41.0)

Participants mentioned that in addition to health problems, excess body weight can also negatively affect normal daily activities, such as work and prayer:

Because of diseases, a healthy weight is a healthy body, I get tired while praying. I am not satisfied with my weight, it affects my work and movements (Group 6, urban, BMI: 28.5)

One woman who was successful in maintaining a healthy weight stated:

Overweight increases your cholesterol, causes diabetes, high blood pressure and heart disease. There is no benefit from being overweight. I have 11 children but thank God that I don't have a big belly because I am concerned about my weight (Group 8, suburban, BMI: 24.7)

### **Weight management behaviours**

#### *Diet and exercise*

Participants discussed different ways of controlling body weight. Most of them agreed that eating less food, eating more salads (vegetables), eating less fat, and exercising are useful for weight management. For example, one of the participants said,

...by eating a diet low in fat, sugar and staying away from chocolates and fast food as well doing exercise daily. (Group 1, suburban)

However, for most women, losing weight was a continuous struggle:

Sometimes I go walking with my family but still my weight is not decreasing, I also have an exercising machine at home (Group 6, urban)

I try to eat less, walk in the evening for half an hour to 1 h but the problem is that I don't continue for a long time... I just stop (Group 8, suburban)

#### *Weight loss medications*

Few of the women used medications to lose weight. Main reasons cited for using weight loss medications were inability to control food intake because of guests and decreased physical activity due to pain. One of the participants said:

I tried to reduce the amount of food I eat and took medications. I cannot control my weight because I have many guests. (Group 5, urban).

Another woman said:

I tried medicine and creams to reduce weight. I am not exercising because of knee pain but before I used to exercise. (Group 5, urban)

Some of the participants cited negative effects of weight loss medications. One of the women who used weight loss medicine said:

First I tried diet control and daily exercise I went to a club for three weeks only because I travelled overseas then I saw an advertisement for tablets that help you lose weight so I tried them for three days but it was a big mistake because these tablets caused allergy for me. (Group 6, urban)

Another woman said:

I will eat less food and exercise, but I will not take medication because it will cause diseases like what happened to a relative of mine. (Group 3, semi-rural)

### Suggestions for weight management programmes/activities

Participants identified a number of ways to promote weight management in Emirati women (Table 3), including establishment of culturally sensitive exercise facilities: designed for women only, not restricting traditional clothes, no security cameras and restricting use of mobile phones with camera. In addition, they suggested walking tracks for women, exercise machines in PHCs, exercise facilities in schools for students, parks to stay open longer during the summer and to have qualified instructors in fitness clubs. They requested dietitians to be available in each PHC to assist them in achieving and maintaining a healthy weight. Other nutrition education services they suggested included community nutrition awareness programmes and workshops to develop skills on healthy cooking.

### Discussion

A number of studies have reported a high prevalence of overweight and obesity in the Arabian Gulf countries and especially among women (Al-Shammari *et al.* 1994, Musaiger & Radwan 1995, Musaiger *et al.* 2000, Carter *et al.* 2004, Al Kandari 2006, Bener & Tewfik 2006, Baynuna *et al.* 2008). According to the International Diabetes Federation, four of the five countries with the highest prevalence of diabetes are in the Arabian Gulf region (International Diabetes Federation (IDF) 2006). Preventive and management programmes that take into consideration the relevant sociocultural factors of the Arabian population are urgently needed to control this growing public health problem.

The present study explored the sociocultural contexts that may affect Emirati women's involvement and perceptions toward weight management by seeking the perspectives of Emirati women at risk for type 2 diabetes. Unlike previous studies that focused on the prevalence rates of obesity of women in the UAE, this study used qualitative research methodology to gain better understanding of the factors that contribute to obesity in Emirati women by seeking the perspectives of the

**Table 3** Suggestions for weight management – sample participant quotes (and health centre setting)

#### Physical activity

**Walking tracks for women:** "We want special places for walking. We want a dietitian in the clubs and clinics, we also want a clean swimming pool" (Group 5, urban)

**Exercise facilities:** "We want a club for only women, we want exercise machines in each clinic and we also want a dietitian in each clinic" (Group 5, urban)

"The club will make us responsible to attend because it will schedule a special time for us to go and exercise so it is good, it will make us go" (Group 3, semi-rural)

"In the school they can open a gym for students to exercise and the ministry of education can provide the school with exercising equipments. The parks close very early, especially in summer; they should not close so early" (Group 7, suburban)

"We want encouragement from the club, they should organise programmes and different sport competitions" (Group 8, suburban)

**Ensure cultural sensitivity of the exercise facilities:** "We want the club to respect our privacy, no security cameras" (Group 7, suburban)

"...To have some control on mobiles with cameras ..... not to be strict with our dress" (Group 7, suburban)

**Exercise equipment:** "Bring new machines, for abdomen, legs and whole body" (Group 1, suburban)

"Exercise equipments for walking, cycling and fitness machines" (Group 2, suburban)"

#### Dietitians

**Access to dietitians:** "We need someone, like a nutritionist, to follow us as we reduce weight so they can motivate us .....we want to know what to eat between meals and how much fat is in it" (Group 7, suburban)

"We want a dietitian in each clinic (Group 5, urban)

**Meal plans:** "We want a program for what we should eat for a month and we will follow it and we want to know what alternative food we can have. We also want a swimming pool for women only" (Group 6, urban)

"We want a program for diet control and we want to know which food we should avoid"

**Cooking skills:** "We do not know how to cook healthy food" (Group 1, suburban)

"We need information about what to cook and how to cook and whether drinking water is okay before or after eating. We need a program [meal plan] so that even if we lose weight we can continue" (Group 7, suburban)

**Dietitians in exercise facilities:** "We want a dietitian in each club to help us lose weight" (Group 4, semi-rural)

women themselves for possible solutions. Winslow *et al.* (2002) have highlighted some of the elements for successfully conducting focus groups with Emirati women, including timing, location and facilitator background. In this study, special attention was given to place and timings of the focus group meetings to enhance participation. The meetings were held in a supportive familiar setting and the facilitators minimised their potential influence on the participant responses by encouraging them to freely express their views and keeping a non-judgemental attitude throughout the discussion. Use of

Emirati facilitators is considered as strength for the study.

Participants in the study were generally aware of the health complications of excess body weight, such as the numerous obesity-related chronic diseases, as well as its effect on normal daily activity, for example, difficulties in movements when praying. Despite this awareness, most of the women were not engaged in regular physical activity or were not following eating patterns consistent with a healthy diet. Personal, social and physical environmental barriers were identified, including social norms (outdoor exercise restrictions and social gatherings involving eating), low social support from families, limited access to dietitians in the health centres, lack of culturally acceptable exercise facilities and hot weather. Similar barriers were identified by health professionals working with Emirati women in a previous study (Ali *et al.* 2009) highlighting that although Emirati women have access to free modern healthcare services, preventive measures for obesity and related chronic diseases need improvement. Berger & Peerson (2009) have reported social and environmental barriers to physical activities among Emirati female college students, including low social support, lack of culturally acceptable exercise facilities and hot weather conditions. Shuval *et al.* (2008) conducted focus group interviews with Arab college students and reported that social environment and social support network have greater influence on the physical activity levels of Arab students than intrapersonal factors, such as attitude and self-efficacy.

Both in the Health Belief Model and in the Pender's Health Promotion model, barriers are considered an important determinant of lifestyle behaviours (Strecher & Rosenstoeck 1997, Pender *et al.* 2006).

Figure 1 presents a conceptual model of barriers and facilitators of weight management in Emirati women and suggestions for minimising these barriers. These suggestions may improve diet and physical activity levels by reducing negative perceptions related to body weight and reduce other barriers to effective weight management. Women in this study articulated well their needs to become more physically active, including access to dietitians in primary healthcare settings, peer walking, walking tracks for women and culturally appropriate exercise facilities. They also suggested recreation parks to be open longer hours, especially during the summer months. These findings are consistent with the Social Ecological model of health promotion (McLeroy *et al.* 1988). The Social Ecological model for health promotion focuses on the importance of interventions directed at changing interpersonal, organisational, community and public policy and emphasises the importance of supportive environment and policies for physical activity.

Our research provides a wealth of information that will be useful in formulating intervention strategies for obesity prevention and management among women in the UAE and will be shared with the relevant government authorities. Furthermore, the findings will also be useful in designing future studies that may involve a larger representative sample of Emirati women. The following suggestions are made to address the multiple weight management barriers faced by Emirati women:

- Implement collaborative partnership strategy: weight management programmes require ongoing support from multiple sectors in the society, including policy-makers, industry, government agencies and the community
- Address structural–environmental barriers: increase availability of culturally-sensitive exercise facilities with qualified exercise instructors for women
- Improve accessibility to dietitians in PHCs
- Enhance social support for women by establishing weight management support groups that include peer group approach for exercise and teaching to facilitate the integration of the required lifestyle changes to the participants' daily lives.
- Implement community awareness activities on nutrition and healthy weights involving use of the mass media.

### Limitations

This study used qualitative research methodology to explore the views of 75 Emirati women on their weight management barriers and facilitators, thus limiting the capacity to extrapolate these findings to Emirati women in general. However, in line with qualitative research methodology, we used data saturation to direct the sample size and have provided a detailed documentation of the research process to assess others in conducting parallel studies in other settings. With the UAE population among the highest prevalence of type 2 diabetes in the world (International Diabetes Federation (IDF) 2006), further studies involving larger representative sample are needed to assist whether the findings from this study and those of a previous one involving primary healthcare professionals (Ali *et al.* 2009) are applicable to Emirati women in general so that appropriate intervention studies can be implemented for the prevention and management of obesity in the country.

### Conclusions

This study sought to identify barriers and enablers of weight management within the sociocultural context of



the UAE to contribute to the future development of culturally congruent healthy weight promotion programmes for women. It identified important aspects of personal, social and environmental barriers and facilitators to weight management among women in the UAE. Furthermore, the conceptual framework that was derived from the study may have elements that can be generalised to healthy weight promotion programmes in other Arabian Gulf countries and beyond. The focus group data collection method proved to be a useful way of identifying the multiple factors that influence weight management behaviours of women at risk for type 2 diabetes in the UAE.

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