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Factors That Influence Physical Activity among School-aged Emirati Females

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Abstract

Research from the United Arab Emirates (UAE) suggests that Emirati school-aged and post-secondary females have low levels of physical activity. This study investigates factors that influence physical activity among 128 female students who attend public schools in Dubai (UAE).

Logistic regression modeling was undertaken to assess factors that predicted low levels of physical activity. Results indicate that 25% do not engage in any physical activity after school hours. Individual-level factors include time limitations (74%), body discomfort especially during the menstrual cycle (47%), feeling embarrassed from wearing sport attire (27%), discomfort or shyness from body perspiration (13%), feeling that physical activity has no personal benefits (13%), and lack of motivation (10%). Other factors include the hot UAE climate (61%), not always having parental support (42%), unpleasant experience of the physical education class during school (27%), lack of safe and private locations for engaging in physical activity (18%), and lack of encouragement from peers (13%). Participants who felt that physical activity has personal benefits were 8.14 times more likely to engage in physical activity after school hours (95% CI 1.62–40.94).

Educational campaigns that enhance awareness about the benefits of physical exercise in the UAE culture are needed and can lead to ample health benefits for the UAE female population.

Introduction

Deaths due to chronic diseases are projected to increase by 17% by year 2015 (1). Research has long documented the benefits of regular physical activity (PA) in preventing and reducing chronic diseases, improving mental health, reducing obesity, and enhancing scholastic performance (2, 3). For children and young adolescents, regular PA is particularly important for preventing or slowing down the development of coronary lipid accumulation in high risk individuals (4, 5). In addition, evidence points to a link between PA levels in childhood and adolescence and activity patterns in adulthood (6).

Research links PA levels in children and adolescents to demographical variables, attributes of the built environment, the natural environment, improvements in technology and transportation, and preference for indoor organized activities (7-13). A review of 108 published studies that evaluated 48 correlates of PA for adolescents found that adolescents' PA levels are positively related to sex (male), ethnicity (white), perceived positive activity competence, good mental health, past history of PA and sedentary behaviour, family / friend support and help, and opportunities to exercise; the review also found that adolescents' PA is negatively related to age (14). Literature documents that PA levels decline as children enter puberty, particularly for females (7, 13, 15). Diverse psychological, behavioural, and physical factors that inhibit young adolescent females from participating in PA have been identified (14). These include self-esteem, perceived physical appearance, recognizing associated benefits, smoking, alcohol use, diet, and social norms; all of which are largely influenced by geographically-specific cultural, social, demographic, and economic landscapes. Although there is a clear need for programs that focus on promoting PA, such programs need to be tailored to specific subpopulations. In addition, programs should be based on a clear understanding of current factors that influence behaviour and that facilitate or hinder young adolescents from participating in regular PA.

Life in Dubai - the second largest city in the United Arab Emirates (UAE) – has changed dramatically over the years. The population of Dubai consists of less than 17% of national origins and a large expatriate population that originates from other countries in the Middle East, Asia, Europe, and North America. Significant gender-related demographic imbalances exist, with females comprising less than 25% of the Dubai population. The city's unprecedented growth has led to rapid transformations in relation to its physical, economic, demographic, and social /

cultural landscapes, which have affected the traditional way of life, the built environment, and opportunities and access to resources, particularly for Emirati women (16). Socio-economic and lifestyle changes that took place influenced food consumption, increasing consumption of meat, poultry, sugar, and fat and decreasing consumption of fresh vegetables and fruits, and thus may be behind the increasing prevalence of chronic diseases (17, 18). Lifestyle changes include a heavy reliance on car transportation, domestic help, and a preference for indoor activities. Research findings point to high prevalence rates of anemia, iron depletion and iron deficiency anemia in the UAE, estimated at 36.1%, 26%, and 9.9% respectively (19). In addition, both obesity and diabetes are high risk factors associated with cardiovascular diseases and are more recently affecting the young UAE population (20).

Few studies have examined the general health and well-being of the Emirati national population and focused on risk factors that have the potential to influence population health, particularly PA among the adolescent UAE national population. A Dubai-based study concluded that 34% of the UAE national adolescent population practiced sports compared to 19% of the expatriates, and that a good level of PA was reported for 26% of males compared to 15% of females (21). Main reported obstacles that prevent participation in regular PA include heavy workload, health problems, and social problems. While this study did not address gender-related determinants of PA among the UAE national sample, other studies document that low levels of PA among the UAE national female population are largely due to cultural and weather restrictions, such as a lack of information about the benefits of PA during school attendance, a lack of desire to participate in sweat-promoting exercise, and transportation problems (9, 22).

With evidence of low levels of PA among the UAE national female adolescent population, there is a dire need to examine factors that influence PA among these young females. Furthermore, since time spent engaging in PA during school hours is insufficient and can be easily avoided by the UAE female adolescent population, the objectives of this research focus on PA levels and factors that predict the likelihood of engaging in PA at one's own time and motivation outside of school hours. The goal is to recommend strategies that increase PA levels among the general UAE female adolescent population, thus improving public health and reducing risk factors associated with chronic diseases.

Method

In order to control for socio-demographic differences, participants for this research included a cluster sample of all national females who attended Grades 7 to 9 (ages 12–15 years) in two randomly-selected all-female public schools in similar neighbourhoods in Mirdif, Dubai. A survey was developed from questions that were generated from focus groups of senior female national students from Zayed University (ZU), Dubai, as part of a senior health research methodology course. Questions were carefully worded to be sensitive and specific to the UAE culture. The questionnaire was translated into Arabic using the cross-translation method recommended by Brislin et al. (1973). The research design and the questionnaire were approved by the Zayed University Human Subjects Committee, which was comprised of Arab and Western researchers from Zayed University. The survey was piloted on a sample of first year student from ZU before it was self-administered over a time-period of 30 minutes in October 2008 (following the Eid period) under the supervision of senior ZU national students.

The 24-item questionnaire consisted of four main sections. The first section consisted of 5 items that collected data related to PA during school hours. This includes two items that asked whether the school gym was indoor or outdoor, and whether the participant enjoys their physical education class at school (yes/no). One open-ended question asked for additional comments in relation to whether the participant enjoys the physical activities that are organized during school hours. Two open-ended questions asked about the participant's favourite physical activities at school and the reasons that the selected physical activities are their favourite.

The second section consisted of four items that collected data related to PA outside school hours. This included two items that asked whether the participant engages in any PA and the preferred location for engaging in PA outside of school hours. For the later item, the following options were provided: home, beach, gym, park, school, other, and 'I prefer not to exercise'. Two open-ended questions asked about the participant's favourite physical activities outside school hours and reasons that the stated physical activities are favoured.

The third section consisted of six items that collected data related to factors that influence the participant to engage in PA. These include whether the participant feels embarrassed to wear sport suits while engaging in physical activities, and whether the participant's family members

encourage the participant to engage in regular physical exercise (yes / sometimes / no). One item asked the participant to specify which listed factors prevents her from engaging in physical activities; listed factors included climate / temperature, lack of time, lack of encouragement from peers, lack of safe and private places, discomfort from body perspiration, and other. In the case of 'other', an open blank was provided for the participant to list any additional factors that prevents her from engaging in physical activities. One item asked whether the participant feels that engaging in physical activities has personal benefits; a follow-up open-ended question asked participants to provide 'reasons' for their answer. Lastly, one item asked whether the menstruation period prevents the participant from engaging in physical activities.

Demographic and self-reported health data include age, nationality, height, weight (the latter two verified using school records - when available - from yearly medical checks that are performed by a medical nurse on public secondary school students), and medical diagnosis with diabetes, asthma, obesity, or any other medical conditions; an open blank was provided for the participant to list any unlisted medical diagnosis.

Data were analyzed using the Statistical Package for the Social Sciences (v-16). Frequencies were calculated for each variable. In addition, answers to open-ended questions were de-identified and analyzed for content analysis of key themes (23), which revealed the preferred forms of PA during school hours, preferred forms of PA after school hours, participants' understanding of the benefits of PA, and barriers / facilitators of PA.

Chi-square analysis was used to determine the strength of the relationships between PA outside school hours and each of the following variables: whether the participant enjoys (or not) the physical activities that are organized during school hours, whether the participant feels embarrassed to wear sport suits while engaging in physical activities, whether the participant's family members encourage the participant to engage in regular physical exercise, and whether each of climate / temperature, time, encouragement from peers, safe and private places, discomfort from body perspiration, and menstruation discourages the participant from engaging in PA.

Logistic regression modeling was undertaken to assess factors that predict PA outside school hours. For the logistic regression model, engaging in PA outside school hours was the

dependent variable. Age and Body Mass Index (BMI) were retained as continuous variables. Dichotomized covariates included whether the participant is embarrassed to wear sport clothes, whether the participant recognizes the personal benefits of PA, whether the participant has any chronic health problems; whether any of the following are barriers for engaging in physical activities outside school hours: temperature / climate, lack of time, and discomfort from body perspiration; availability of safe and private places, and encouragement from peers. Parental support for regular PA classified into three categories (no parental support, some parental support, and parental support) and included in the analysis. Results are displayed in terms of the relative odds for each variable, the statistical significance of each predictor, and the rho-square (i.e. goodness of fit measure). An odds ratio (OR) greater than one indicates an increased likelihood and an odds ratio less than one indicates a decreased likelihood. A rho-square of 0.2 to 0.4 is generally considered to represent a good fit (24). In addition, the specificity (proportion of correct prediction of non-cases) and sensitivity (proportion of correct predictions of cases) of the model are presented.

Results

All female students that were selected into this study participated; participants (n=258) consisted of 21% of the total number of students in both schools. All participants were national females between the ages of 12 and 15 years. Body mass index ranged between 11.9 and 40.4, with 7% of females classified as overweight or obese based on the new international classification developed by the International Obesity Taskforce (25). In terms of medical health diagnosis, 15% reported at least one chronic health condition; this includes 7% diagnosed with asthma, 2% diagnosed with diabetes, and the remainder diagnosed with other conditions such as hypertension, heart problems, and anemia.

Results indicate that all participants were aware of the availability of an indoor gym on their school premises; 27% of participants did not enjoy PA during school (Table 1). Participants stated that boring physical education classes and tough teachers deter them from enjoying PA during school hours. The most preferred physical activities during school hours include basketball (39%), football (soccer) (26%), volleyball (6%), and badminton (6%). Results indicate

that 25% of participants do not engage in any PA after school hours. Preferred locations for engaging in PA include one's home (58%), nearby gym (30%), the beach (20%), and an outdoor park (10%). The most preferred physical activities after school hours include football (soccer) (31%), basketball (11%), running (8%), and jump-rope (5%).

Results suggest that several factors act at the individual-level to contribute to low PA levels. Significant associations were found between PA outside school hours and each of the following: whether the participant's family members encourage the participant to engage in regular physical exercise (Chi-square=7.89, $p=0.019$), and whether the participant feels that physical education has personal benefits (Chi-square=11.78, $p=0.001$). Eighty-five percent of participants whose family members encourage them to engage in PA report doing so, compared to 68% of participants who receive some parental encouragement and 54% who receive no encouragement. Eighty percent of participants that felt that PA has personal benefits engaged in PA after school hours compared to 40% from those that did not feel that PA has personal benefits. Results of the logistic regression modeling of PA after school hours indicate that one variable was significant in predicting PA after school hours (Table 2). Participants who felt that PA has personal benefits were 8.14 times more likely to engage in PA after school hours (OR=8.14, 95% CI 1.62–40.94). Although most of the variables were non-significant, the model had an overall predictability of 77% and a rho-square of 0.22.

Results indicate that participants do not understand the benefits of PA. This was apparent from the absence of answers in relation to the open-ended question that asked about reasons that the participants feel that PA has personal benefits. In relation to factors that prevent participants from engaging in PA, answers to the open-ended question included the absence of fun in the school physical education class, tough instructors, high costs associated with female sport clubs, and limited area for physical exercise at home. Results also indicate that the health status of participants may influence their PA level. For instance, asthmatics reported that their health condition prevents them from engaging in PA due to shortage of breath during physical exercise. Females who had a relatively higher body mass index self-perceive that they are less fit and they stated that they easily get tired, thus preventing them from engaging in PA. On the other hand, diabetics turned to PA as a means for regulating their blood sugar level.

Analysis

Few studies have examined PA among national UAE females. Low levels of PA have been reported among college UAE national female students (9) and UAE national female adolescents (22). These studies have identified barriers that prevent regular PA, such as a lack of information on the benefits of PA during school attendance, a lack of desire to participate in sweat-promoting exercise, and transportation problems. Consistent with these findings, this research suggests that UAE national female adolescent students do not understand the benefits of PA. A lack of understanding of the benefits of PA along with unpleasant experiences are key factors that are likely to promote sedentary lifestyles and high levels of physical inactivity among UAE national females. In addition, results point to cultural barriers that may prevent young UAE national female adolescents from engaging in PA. Cultural barriers may include embarrassment that results from wearing sports' attire, discomfort from body perspiration, and body discomfort during menstruation. Cultural perceptions associated with the female body may prevent participation in certain activities such as sweat-promoting activities or activities culturally related to masculinity (9). Furthermore, results indicate that barriers for engaging in PA include unavailability of safe and private places and the costs associated with frequenting an all-female health club.

Discussion

There are several key implications of these results. First, these findings point to the importance of strengthening physical education as an integral component of the education curriculum in UAE public schools. Important factors that can potentially increase regular PA after school hours should focus on the benefits of regular PA, and other perceived cultural barriers. Physical education should target barriers to PA, such as perceived uncleanness associated with body perspiration, restrictions on presenting the female body in sport attire, and the absence of local female role models. Results of this research highlight that there are key issues that need to be addressed at the school level in order to breed a culture that promotes females to engage in PA. This in turn will lead to future generations that understand the benefits

of regular physical exercise. This is particularly important given evidence of high levels of obesity in the UAE female population (22).

A second implication of this research points to the importance of focusing on larger contextual factors that have the potential to promote regular PA among young adolescent females. For example, awareness campaigns that target parents and the general public can be organized that highlight the benefits associated with PA; in addition, planning policies should focus on increasing the availability of safe and private places in which females can participate in regular physical exercise. While most female schools have indoor gyms, the availability of safe and private places at the community level has the potential to increase PA among young adolescent females. Although public beaches in Dubai currently have a model where they are open only for females two days of the week, there may be a need for additional low cost locations at the community scale that promote females to engage in regular physical exercise.

While this research demonstrated several significant findings, it was not without limitations. This research is limited by sample size. Results may not be generalized to other UAE adolescent females or to other schools until further research is completed. In addition, this research did not inform the levels, frequency, or duration of PA among the national UAE female population rather factors that may hinder UAE national females from engaging in any PA. Nevertheless, important and interesting barriers to PA were identified. Future studies should utilize a larger sample of young women to examine the level of PA among the UAE national female population, with an emphasis on various age cohorts of females from the UAE. Further studies can also focus on females' and males' perceptions of the risks of physical inactivity on the development of chronic diseases in the UAE.

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Table 1. Reported factors that prevent young female UAE nationals from engaging in physical activity.

Variable	n	%
Do not enjoy the physical education class during school hours	68	27
Time restricts physical activity	188	74
Embarrassment that results from wearing sports attire	76	30
Body discomfort during menstrual cycle	120	47
Feels that physical activity has no personal benefits	34	13
Discomfort / shyness from body perspiration	34	13
No motivation / lazy	26	10
No parental encouragement	26	10
Parental encouragement only sometimes	106	42
Lack of encouragement	34	13
Unavailability of safe or private places	46	18
Hot temperatures / climate	154	61

Table 2. Determinants of physical activity among school-aged Emirati females.

Variable	Reference	OR	p-value	95.0% C.I.
Age		1.38	0.35	(0.71, 2.70)
BMI		1.09	0.30	(0.93, 1.27)
Embarrassed from wearing sport clothes in school	Embarrassed	1.95	0.34	(0.50, 7.53)
Body perspiration	Discomfort	1.01	0.99	(0.12, 8.54)
Feelings about physical activity *	No personal benefits	8.14	0.011	(1.62, 40.94)
Chronic health problems	Yes	2.27	0.23	(0.60, 8.63)
Time availability	Preventative	1.41	0.68	(0.28, 7.02)
Enjoy physical activity at school	No	1.21	0.83	(0.27, 5.41)
Menstrual cycle	Preventative	1.30	0.69	(0.36, 4.68)
Motivation	Not motivated / lazy	1.92	0.55	(0.22, 16.39)
Temperature / climate	Preventative	1.82	0.45	(0.39, 8.33)
Availability of safe / private places	Preventative	1.03	0.97	(0.24, 4.49)
Parental Encouragement	None			
	Sometimes	1.25	0.80	(0.22, 6.92)
	Yes	3.92	0.15	(0.60, 25.66)
Encouragement from peers (Not preventative)	Preventative	1.61	0.62	(0.09, 3.95)
Sensitivity (%)		90		
Specificity (%)		46		
Rho-square		0.22		