

PHYSICAL ACTIVITY OF ARAB MUSLIM MOTHERS OF YOUNG CHILDREN LIVING IN THE UNITED STATES: BARRIERS AND INFLUENCES

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Objectives: To examine physical activity (PA) levels, and how sociocultural factors, acculturation, self-efficacy and religion influence PA levels of Arab Muslim mothers of young children living in the United States.

Design: Cross-sectional online survey.

Participants and Setting: Arab Muslim mothers of young children (aged <5 years) living in the United States (N=447).

Variables Measured: PA levels, sociocultural and religious barriers to PA, self-efficacy, strength of religious faith, and acculturation.

Results: Barriers to PA included dress code and negative perception of women who engaged in PA, lack of motivation and stress, and responsibilities. Barriers and self-efficacy significantly influenced PA levels ($P < .001$) but strength of religious faith and acculturation did not.

Conclusions: Confirmation of the relations among self-efficacy, barriers and PA levels among Arab Muslim mothers of young children in the United States may help professionals tailor culturally sensitive interventions to combat obesity and other chronic diseases among this growing population. *Ethn Dis.* 2019;29(3):469-476; doi:10.18865/ed.29.3.469

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INTRODUCTION

The rising prevalence of overweight and obesity is related, in part, to insufficient physical activity (PA). A sufficient PA level for adults is defined as at least 150 minutes of moderate-to-intense aerobic activities and at least two hours of muscle strengthening activities per week.¹ However, intrapersonal struggles, environmental opportunities, culture, and religious influences can affect an individual's ability to meet these recommendations.

People from the Arab world have low adherence to PA recommendations compared with their Western peers, as reflected in the high rates of obesity in the Arab region.^{2,3} In 2013, five Arab countries (Bahrain, Egypt, Saudi Arabia, Oman and Kuwait) reached the highest levels of overweight and obesity in the last three decades compared with other countries of the world.⁴ Moreover, the United States, along with three Muslim countries (Egypt, Pakistan and Indonesia)⁴ reached remarkably high rates of overweight and obesity. These rates doubled over the last 30 years among Arab women.⁴ Poor dietary habits, urbanization and sedentary lifestyles are signifi-

cant causes to this striking increase.⁵

Recent literature suggests a significant association between increased body weight and strength of religious affiliation in the United States.^{6,7} Although the Islamic religion specifically stresses the importance of PA and demands an active lifestyle, it is especially difficult for women to be physically active in this strict culture.³ One aspect of the Islamic faith that may impact a women's ability to engage in PA is the expectation for modest dress, including clothing that covers most of the body.

Acculturation is defined as adoption of attitudes, values, customs, beliefs, and behaviors of immigrants in a new culture.⁸ Studies conducted of immigrants to Western societies found that the health of immigrants declines upon arrival to Western countries due to changes in lifestyle practices such as walking less often and following less healthy eating patterns.^{9,10} However, Tailakh et al¹¹ recently reported that greater acculturation was associated with higher levels of PA in a study group of primarily male Arab Americans.

Inadequate PA is especially evident among Arab Muslim females.³ Modest dress, inability to exercise in public, sex discrimination,

low self-efficacy, lack of knowledge and motivation are reported barriers to performing PA among these women.^{3,12,13} Furthermore, women with children are less active than women without children,¹⁴ especially when children are aged <5 years.¹⁵ Mothers of younger children experienced alterations in their PA habits after having children due to changes in their responsibilities toward their children, especially

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during childbearing stages.¹⁶⁻¹⁸ Some of the barriers reported by Australian mothers of young children included: lack of motivation; time, especially for working mothers; and lack of childcare.¹⁹

Research, which addresses specific barriers to and influences of exercise among Arab Muslim populations living in Western societies, remains scarce. Therefore, the objec-

tives of our study were to: 1) estimate current PA levels of Arab Muslim mothers of young children; and 2) examine how sociocultural factors, acculturation, self-efficacy and religion influence PA levels among Arab Muslim mothers of young children.

METHODS

Participants

Arab Muslim mothers of young children (aged 0-5 years) living in the United States were recruited to participate in this study after obtaining approval from the Oklahoma State University institutional review board. Faith leaders from mosques in Virginia, Maine, Texas, Oklahoma, Ohio and Florida were asked to send emails to women in their community inviting them to participate in the questionnaire. Also, closed Facebook groups for women living in the United States from Egypt, Libya, Iraq, and Tunisia were contacted and agreed to invite their members to participate. Finally, women were recruited from Islamic foundations and associations in the United States, including the Texas Muslim Women's Foundation and Saudi Arabian Islamic Clubs in Oklahoma.

Women from 14 different Arabic countries registered to participate in the study (N=632). Of those, 447 women met the criteria of being Arab, Muslim, a mother of at least one child under the age of five and living in the United States.

Questionnaire

We distributed a questionnaire on PA levels, socio-cultural and religious

barriers to and influences of performing PA, and religiosity to Arab Muslim mothers of young children residing in the United States. The questionnaire was distributed in English and Arabic via Qualtrics, an online platform for the questionnaire. Reminders to complete questionnaires were sent automatically via Qualtrics one week after initial distribution. The following components were included in the questionnaire.

Socio-Cultural and Religious Barriers to Physical Activity

We assessed factors that influence behaviors regarding PA with questions from common themes that arose from previously conducted focus groups with Arab Muslim mothers of young children. We developed focus group and survey questions based on the Theory of Triadic Influence.²⁰ Participants rated statements about barriers to PA using a 4-point Likert-type format (strongly disagree to strongly agree). Using factor analysis, we categorized specific barriers and, extracted independent factors, labeled and scored by summing ratings of the barriers. The Cronbach alpha for the barriers questions was .823.

Physical Activity Levels

We used the Godin Leisure-Time Exercise Questionnaire for self-reported measures of the level and strength of PA. This two-item tool has been shown to be highly reliable to assess levels and strength of PA of adults aged 18-65 years.²¹

Self-efficacy

The question "How confident are you in your ability to be physi-

cally active?" assessed self-efficacy. Respondents answered according to the level of agreement (1= Very confident to 5= Not confident at all).

Strength of Religious Faith

Using the Santa Clara Strength of Religious Faith Questionnaire, we measured participant level of religiosity.²² Nine items assessed religious strength regardless of the religious faith and affiliation. Respondents answered according to the level of agreement (1 = strongly disagree to 4 = strongly agree). The total scores were summed. The item "I pray daily" was removed from the analysis to increase reliability of the tool (Cronbach alpha=0.782).

Acculturation

The Male Arab American Acculturation Scale, an eight-item self-reported questionnaire that measures acculturation of adults from Arab origins to American culture was used because no similar scale was available for women.²³ Acculturation levels of the participants were evaluated using the internalization vs marginalization (IVMS) and (SVAS) subscales of the Arab American Acculturation Scale. Women answered questions about two types of acculturation, levels of separation and integration (SVAS) (Cronbach alpha=.731) and the integration vs marginalization (IVMS) subscale (Cronbach alpha=.794). Each question was scored on a 7-point Likert-type scale from strongly disagree to strongly agree. Scores for each question (reverse-point and positive) were summed to rate the level of acculturation.²³

Table 1. Demographic characteristics of Arab Muslim mothers of young children living in the United States, N=477

Variable	n	%
Country		
Libya	269	60.2
Egypt	64	14.3
Palestine	34	7.6
Jordan	33	7.4
Iraq	14	3.1
Other Arab countries	33	7.4
Total children		
1	74	16.6
2	159	35.6
3	129	28.9
4	61	13.6
5 or more	24	5.4
Number of children under 5 years		
1	228	51.0
2	185	41.4
3 or more	34	7.6
Years living in the US		
10 years or more	60	13.5
5 to less than 10 years	127	28.4
1 to less than 5 years	215	48.1
Less than 1 year	45	10.1
Primary reason for coming to the US		
Accompanied husband	228	51.0
School	119	26.6
Immigration	56	12.5
Other	44	9.9
Age, years		
18-23	10	2.2
24-29	135	30.2
30-34	191	42.7
35-40	97	21.7

Statistics

Analyses were performed using the Statistical Package for the Social Sciences (SPSS 23.0) software. Descriptive statistics were calculated for all variables. Factor analysis was conducted to further increase understanding of barriers to performing PA. A fixed factor solution explained 42% of the variance (24%, 10% and 8.7%) for factors 1, 2, and 3, respectively. A fixed factor solution was preferred because it better defined the factor structure and could be in-

terpreted and supported by previous theoretical data. Factors had Eigen values of ≥ 1 . Solutions for the factors were each examined using Varimax rotation of the factor loading matrix. All items included had primary loading of .4 or above. The item "It is expensive to enroll in a gym" was not included in final factors because the factor loading weight was $<.4$. Scores for each of the three factors were computed by summing the ratings of items that had a primary loading of .4 or higher on the factor. Higher

Table 2. Importance and self-efficacy of PA for Arab Muslim mothers of young children living in the United States, N=447

Variable	n	%
Importance of PA		
Very important	191	52.3
Important	105	28.8
Somewhat important	52	14.2
Not important	15	4.1
Not at all important	2	0.5
Self-efficacy PA		
Very confident	54	14.8
Confident	70	19.1
Somewhat confident	139	38.0
Not confident	93	25.4
Not at all confident	10	2.7

scores indicated a greater barrier or influence on physical activity. Multiple regression analysis was conducted to evaluate the relationship between the mother's PA levels and strength of religious faith, acculturation, and self-efficacy. All tests for statistical significance were two-tailed, and $\alpha=.05$.

RESULTS

The majority of women (92.4%) had 1 or 2 children under the age of five and lived in the United States between 1 and 9 years (76.5%). Most of the women (77.6%) came to the United States either to accompany their husbands who were completing higher education or to go to school themselves. Most of the participants (60.2%) came from Libya (Table 1). Self-reported weekly PA levels of women revealed that most women (75.6%) did not perform strenuous PA, and about 40% reported never participating in moderate or mild exercise during their leisure time in the past week. The average weekly leisure activity score was 15.1 ± 16.6 (data not

shown). Almost all women (95.3%) reported that it was somewhat important, important or very important to be active. However, only 33.9% felt they were confident or very confident that they could maintain a physically active lifestyle (Table 2).

Nineteen barriers and influences to performing PA were analyzed using factor analysis. Three factors were extracted: 1) dress code and negative perception; 2) lack of motivation and stress; and 3) responsibilities (Table 3). Dress code and negative perception toward Arab Muslim women who are involved in sports or exercise explained more of the variance in the barriers (24%) followed by lack of motivation and stress, and responsibilities (10% and 8.7% of the variation). The average ratings for the dress code and negative perception and responsibilities factors indicated that many women disagreed with these statements. For example, only 36.3% of the participants agreed or strongly agreed that lack of female facilities was a barrier to being active and fewer than 25% of the mothers felt that lack of childcare, feeling stressed exercising with their

children and their responsibilities were barriers to PA. The average rating for the PA barrier of lack of motivation and stress was 2.7 ± 0.5 , indicating that fewer women disagreed with the statements. For example, most women felt stressed (76.1%), embarrassed to exercise in public (59.8%) and uncomfortable to dress in gym clothes (82.7%).

The majority of the women had high levels of religious affiliation. Women reported that their religious faith influenced their choices, personality and behavior. The mean rating for strength of religious faith was 30.7 ± 5.2 out of 36 points. Most women reported moderate acculturation levels. The average score for IVMS was 16.7 ± 5.4 and SVAS was 18.3 ± 4.2 out of 20 points.

Multiple regression analysis was conducted to evaluate the influence of strength of religious faith, PA barriers (ie, dress code and negative perception, lack of motivation and stress, and responsibilities), self-efficacy, and acculturation (IVMS and SVAS) on PA levels of the women (Table 4). The regression model explained 21% of the variation in weekly leisure activity scores ($P < .001$). Lack of motivation and stress, and responsibilities were significantly negatively associated with PA levels of the women and self-efficacy was positively related. However, dress code and negative perception, strength of religious faith, and acculturation (IVMS and SVAS) were not associated with PA levels.

DISCUSSION

The objective of this study was to examine the sociocultural factors, ac-

Table 3. Factor loading matrix and factor scores based on factor analysis with varimax rotation for 19 items of the socio-cultural barriers and influences to PA among Arab Muslim mothers of young children living in the United States, N=447

Barriers to PA	Factor loading ^a	Strongly disagree, n (%)	Disagree, n (%)	Agree, n (%)	Strongly agree, n (%)	Mean ±SD ^b
Dress Code and Negative Perception						2.3 ± 0.6
I do not have access to female-only facilities	.724	95 (28.7)	116 (35.0)	83 (25.1)	37 (11.2)	
I cannot exercise with men in the gym	.645	124 (37.5)	110 (33.2)	66 (19.9)	31 (9.4)	
Some people look at women in hijab exercising differently	.623	37 (11.2)	104 (31.4)	142 (42.9)	48 (14.5)	
Arab individuals have a negative perception of women who are physically active	.584	46 (13.9)	101 (30.5)	148 (44.7)	36 (10.9)	
Crowded gyms halt my ability to exercise	.593	55 (16.6)	137 (41.4)	100 (30.2)	39 (11.8)	
Arab men in the gym will halt my ability to enter the gym and exercise	.573	81 (24.5)	112 (33.8)	108 (32.6)	30 (9.1)	
Dressing in hijab and multiple layers affects the amount and type of activities I can perform	.548	61 (18.4)	125 (37.8)	101 (30.5)	44 (13.3)	
I feel hot when wearing hijab and exercising in public	.417	40 (12.1)	117 (35.3)	129 (39.0)	45 (13.6)	
Lack of Motivation and Stress						2.7 ± 0.5
I do not have the motivation to exercise	.748	29 (8.8)	76 (23.0)	167 (50.5)	59 (17.8)	
I feel stressed when I exercise	.691	18 (5.4)	61 (18.4)	195 (58.9)	57 (17.2)	
I am disorganized in my time and priorities and that affects my ability to exercise	.526	53 (16.0)	161 (48.6)	90 (27.2)	27 (8.2)	
I am embarrassed to exercise in public	.475	40 (12.1)	93 (28.1)	132 (39.9)	66 (19.9)	
I feel uncomfortable with wearing pants or "gym clothes"	.424	13 (3.9)	44 (13.3)	208 (62.8)	66 (19.9)	
Responsibilities						2.1 ± 0.6
There is nobody to take care of my children when I am exercising	.797	110 (33.2)	157 (47.4)	50 (15.1)	14 (4.2)	
It can be very stressful to exercise with the kids	.677	96 (29.0)	154 (46.5)	69 (20.8)	12 (3.6)	
I have other responsibilities and priorities	.657	89 (26.9)	172 (52.0)	62 (18.7)	8 (2.4)	
I do not have time to exercise	.621	52 (15.7)	126 (38.1)	130 (39.3)	23 (6.9)	
Bad weather can inhibit my motivation to exercise	.538	59 (17.8)	181 (54.7)	79 (23.9)	12 (3.6)	

a. Only items with factor loadings ≥.4 are displayed and listed in order of factor loadings for simplicity and easy interpretation.

b. Scores were calculated strongly disagree=1; disagree=2; agree=3; and strongly agree=4 and averaged for the items in each factor.

culturation, self-efficacy, and religion related to PA levels among Arab Muslim mothers of young children living in the United States. Socio-cultural and intrapersonal factors including lack of self-efficacy, lack of motivation and stress, and family responsibilities were the main influences that decreased the ability of Arab Muslim mothers of young children

to be physically active. According to Brown et al,²⁴ PA levels and leisure activities in women were generally controlled by the level of income, time, and access to facilities and programs as well as cultural expectations of what was considered appropriate behavior of a woman toward her family. Similar to our findings, Mailey et al¹⁸ showed that self-efficacy was

related to engagement in PA and perception of barriers to PA, thus undermining PA as a priority compared with family responsibilities.

According to women included in this study, lack of motivation was a significant barrier to performing PA and was associated with lower PA levels. Also, the Arab community was unwelcoming to Arab Muslim

Table 4. The influence of barriers to physical activity, self-efficacy, strength of religious faith and acculturation on physical activity levels of Arab Muslim mothers of young children living in the United States, N=447

Variable	R ² (P)	Dress code and negative perception ^a	Lack of motivation and stress ^a	Responsibilities ^a	Self-efficacy ^a	Strength of religious faith ^a	IVMS ^a	SVAS ^a
PA level	.211 (<.001)	-.022 (.727)	-.131 ^b (.045)	-.231 ^c (<.001)	.266 ^c (<.001)	.089 (.112)	.074 (.213)	-.004 (.951)

females who engaged in PA and family members held negative attitudes toward women who exercised and engaged in sports. Another study found that Arab women reported more barriers to performing PA and

Socio-cultural and intrapersonal factors including lack of self-efficacy, lack of motivation and stress, and family responsibilities were the main influences that decreased the ability of Arab Muslim mothers of young children to be physically active.

faced sex discrimination and more sociocultural barriers than Arab men.¹³

Research suggests that young mothers with children performed significantly less PA compared with women without children due to increased family responsibilities.^{15,16} An

Australian study found that women with children felt twice the pressure of having inadequate time to exercise than men.²⁵ Women, as primary caregivers, often did not perceive leisure activity as being a priority within the hierarchy of demands toward their children and family.²⁶ Children, especially those who are younger than five years of age, required more attention than older children.^{16,17} Australian mothers of children under five reported that lack of childcare was among the major barriers to exercise.¹⁹ We found that competing priorities and feeling a sense of commitment were barriers that influenced the ability of some mothers to be physically active. Women who felt more family responsibility, but not lack of childcare, reported less PA. Another study conducted among Bahrain adults revealed that women were less physically active than men because of the sociocultural barriers of commitment toward their home, family and childcare.²⁷

In this study, dress code and negative perception toward women who exercised were barriers to PA, but these barriers were not associated with PA levels. The majority of the women felt a sense of embarrassment, shyness, and discomfort wearing athletic clothing when exercising. Culture and not being familiar with females who engaged in PA in their country of origin may influence the women's at-

titudes toward PA and decrease their motivation to be physically active.

Cultural and religious barriers can halt the immigrant's ability to integrate and interact with the new society.² The findings of this study suggest that Arab Muslim mothers had high strength of religious faith and moderate acculturation and leisure PA levels. However, neither strength of religious faith nor acculturation were significantly related to PA levels when barriers and self-efficacy were included in the regression model. Other studies found that individuals with higher levels of religious affiliation were likely to be less active.^{6,7} Muslim women reported not feeling comfortable exercising while wearing modest dress and that clothing can be an obstacle to PA.^{12,24} The systematic review conducted by Gerber et al²⁸ showed conflicting reports of the relation between acculturation and PA levels. Increased language proficiency and immigration to the host country at an earlier age were major factors that increased leisure time PA levels among Finnish, Chilean and Iraqi women who immigrated to Sweden.²⁹

Limitations to this study included self-reported responses to the questionnaire, which may result in some error. Also, most women who completed the questionnaire came from the same Arab country (ie, Libya) which may limit the generalizabil-

ity of the results, especially regarding dress code barriers to physical activity.

Our findings suggest that low levels of PA among participants were influenced by dress code, negative perception of women who participate in exercise and sports, lack of motivation and stress, responsibilities, and low self-efficacy to be active. The outcomes of this study may help professionals address specific challenges to behavior change. It is important to implement tailored programs that target cultural and linguistic barriers and diversity among immigrants to the Western society. Suggestions for this programming include familiarization with the first steps to being active and motivation by social support from family, peers and community. Such studies and interventions may potentially increase preventative health care precautions and improve the health of mothers and families of immigrants in the United States.

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CONFLICT OF INTEREST

No conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Research concept and design: Eldoumi; Acquisition of data: Eldoumi; Data analysis and interpretation: Eldoumi, Gates; Manuscript draft: Eldoumi, Gates; Statistical expertise: Gates; Administrative: Eldoumi; Supervision: Gates

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