

Effects of Parenting Styles and Family Contributors on Physical Activity Behaviors in Arab Children Ages 6-10 Years Old Living in the US

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Abstract: The purpose of this study was to explore the effects of parenting styles and family contributors on physical activity behaviors in Arab children living in the US. This mixed-method study included the Caregiver's Feeding Style Questionnaire (CFSQ), Family Nutrition Physical Activity (FNPA) survey, and five focus group discussions (FGD), guided by the Social Cognitive Theory (SCT). Twenty-three Arab mothers of 37 children aged 6-10 years old participated in this study. Seventeen mothers were overweight or obese, and six children were overweight or obese. Although all Arab mothers self-assessed that they were authoritative, only seven mothers were categorized as having an authoritative feeding style based on their CFSQ scores. The FNPA overall mean was 3.15, indicating less obesogenic family environments and behaviors. Across FGDs, common physical activity barriers included lack of time, the child being distracted by technology, and lack of a mother's interest in a child's physical activity due to culture and fear. Positive approaches included considering the child's interest in sports and involvement in physical activity with the child. Negative attitudes included pushing the child to do sports and the mother's lack of interest in physical activity. In correlation analyses, the mother's BMI was significantly correlated with the child's BMI z-scores ($r = 0.325$, $p = 0.005$). No significant associations were found between reported feeding styles (CFSQ), obesogenic family environments (FNPA), and child's BMI z-scores. This study can guide future efforts in developing effective education programs, including physical activity behaviors for Arab families.

Keywords: Arab mothers, childhood obesity, parenting styles, parenting practices, physical activity, focus groups, mixed methods.

BACKGROUND

Overweight and obesity in children have reached epidemic status worldwide and among different population groups. In the United States (US), findings from the 2009-2010 National Health and Nutrition Examination Survey (NHANES) found that 32.6 % of children aged 6-11 years old were considered to be either overweight or obese, and 18.0 % were considered to be obese [1]. In Arab countries, a systematic review estimated the prevalence of overweight and obesity in children to be 22.2% and 27.9%, respectively [2]. Lifestyle behaviors and patterns of children are influenced by personal factors, including preferences for physical activities, self-efficacy or confidence at doing an act, ability to overcome barriers to a behavior, and outcome expectancies (perceived positive or negative outcomes from doing an act) [3]. For children, it can be difficult to meet recommended physical activity levels when they are exposed to environments that promote physical inactivity in their homes [4].

Parenting styles help to describe the degree of interaction between the parent and child, such as discipline, support, warmth, and caring [5]. Based upon two aspects (control and love) of parenting behaviors, different parenting styles have been identified [6, 7]. In parental control (demandingness), parents manage their children's behaviors, set rules and demands, and expect their children to follow the rules [8]. In parental warmth (responsiveness), parents accept their children's behaviors and express their love and concern to them. When these parenting behaviors are combined in different ways, four main parenting styles (authoritative parents, authoritarian parents, permissive parents, and neglectful/uninvolved parents) emerge. Cultural values can influence parental decisions and socialization practices [9]. Preservation of traditions, customs, and culture is placed in high importance in Arab families and their children [10]. Additionally, it is important to take acculturation into account when studying minority groups in the US, since parents are often influenced by the dominant culture [11]. Moreover, children learn from their parents how to socially develop and adapt to the host culture/society [12]. Furthermore, if parents are bicultural, they may endorse parenting styles and practices similar to the dominant culture while preserving practices that reflect traditional cultural values.

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To date, no research has been reported on parenting styles/practices and family contributors to the development of obesity in Arab children living in the US, and factors influencing their physical activity behaviors. To address the health education needs of persons with Arab ancestry, it is important to have more information about parental styles/practices and family contributors that influence children's physical activity behaviors and to identify gaps in parents' knowledge and challenges to healthier behaviors. This study of Arab mothers and their children in the US aimed to collect exploratory data on mothers' parenting styles and family contributors to physical inactivity which can influence the development of childhood obesity

METHODS

Study Design, Measures, and Sample

The mixed-method design included the quantitative Caregiver's Feeding Styles Questionnaire (CFSQ) [13] and Family Nutrition and Physical Activity [FNPA] survey [14] and qualitative focus group discussions (FGD) that collected data on parenting feeding styles of Arab mothers and family contributors to the development of obesity in their children. The convergent parallel design of the quantitative and qualitative strands was of equal priority and applied independently at the same time for cross-validation (triangulation) [15].

The CFSQ categorized participants into four different parenting feeding styles: Authoritative, Authoritarian, Indulgent, and Uninvolved [13]. The FNPA assessed ten risk factors (breakfast and family meal, modeling of nutrition, nutrient-dense foods, high-calorie beverages, restriction and reward, TV/video game/computer screen time, TV in the bedroom, parent modeling physical activity, child's physical activity, and sleep schedule) found to be associated with obesity in children [14]. The FNPA tool used a Likert type scale of four possible responses to each question (1 represents a negative or more obesogenic family environment, and 4 represents a positive or less obesogenic family environment). The CFSQ and FNPA surveys have been tested for validity and reliability with Arab mothers [16].

The FGD was conducted by first author Tami, who is bilingual in Arabic and English. The open-ended questions were guided by the Social Cognitive Theory (SCT) with its six constructs (reciprocal determinism,

behavioral capability, expectations, self-efficacy, observational learning, and reinforcement) that suggest that individuals learn behaviors from the surrounding environment and through observation [17, 18]. The questions focused on the mothers' challenges related to their child's physical activity behaviors, strategies they used to encourage their child to be physically active, and additional information/resources that would be helpful.

The Participant Background Survey (PBS), previously used to collect demographic and acculturation data in Arab women [19], was used to collect additional information on the child's age, gender, height, and weight and mothers' self-assessed parenting style. Before starting the FGD, mothers completed the PBS, CFSQ, and FNPA surveys and were weighed privately using a Tanita scale (model SC-331S Tanita, Toyoko, Japan).

The sample included Arab mothers of children, ages 6-10 years old, who lived in the Dallas, TX area. They were recruited to participate in the study via flyers and word of mouth at local Islamic schools and centers. As incentives, all participants were entered into a drawing for a \$20 gift card, served a light meal, and received nutrition education materials after data collection. The study was conducted at a local Islamic Center. Texas Tech University's Institutional Review Board for the protection of human subjects approved the study protocol.

Data Analysis

Quantitative Data Analysis

Quantitative data obtained from the PBS were analyzed using the Statistical Package for Social Sciences software (SPSS, v. 23, 2014) Each child's BMI-for-age percentile was calculated using the CDC's BMI-for-age growth chart calculator [4], and BMI z-scores were calculated using a specialized CDC SAS program [20].

For scoring the CFSQ, two scores were derived – demandingness and responsiveness [13]. The mothers were categorized into high and low categories on demandingness and responsiveness and into feeding styles based on their scores on demandingness and responsiveness:

Authoritative Feeding Style: high
demandingness/high responsiveness

Authoritarian Feeding Style: high demandingness/low responsiveness

Indulgent Feeding Style: low demandingness/high responsiveness

Uninvolved Feeding Style: low demandingness/low responsiveness

As for reported obesogenic family environments and behaviors measured by the FNPA, the mean of each participant's responses to all FNPA questions was calculated, and the overall mean across all participants was also calculated. Kendall's tau correlation analyses were used to determine the relationships between the child's BMI z-scores and mother's weight, between the child's BMI z-scores and the parenting feeding style (CFSQ), and between the child's BMI z-scores and the home environment behaviors (FNPA).

Qualitative Data Analysis

Each FGD was audio-recorded, transcribed, and translated to English. A code list for the transcripts was developed, and the transcripts were coded separately by two coders. Once the coding structure was completed, inter-coder reliability was determined by percentage agreement for coding statements into the themes, using the Holsti formula [21, 22]. The coding agreement was 81%, which is considered reliable [23]. The transcripts were imported into a software program for qualitative data analysis, ATLAS.ti (Version 7, 2014, ATLAS.ti Ink). ATLAS.ti helped organize the data and assisted in identifying the codes most frequently used. Themes were derived based on the codes and concepts that trended across the FGD.

RESULTS

Characteristics of Participants

Twenty-three Arab mothers of 37 children aged 6-10 years old participated in this study (Table 1). Most mothers were ages 30-35, had a bachelor's degree, and had a family income of \$40,000 – 59,999. In total, the participants had 37 children (19 males and 18 females) (data not shown) who were mostly 6 -10 years old. Seventeen mothers were overweight or obese, and six children were overweight or obese.

The mothers' mean length of time in their original country was almost equal to their length of time in the US (approximately 16 years for each). The Arabic language was the most used language for speaking, reading, writing, at home, and with friends for 16

Table 1: Characteristics of the Arab Mother Participants (n = 23) and their Children (n = 37)

Characteristics	Frequency (%)	Mean (SD)
<i>Mother's age (years)</i>		38.43 (5.46)
30 – 35	10 (43.5)	
36 – 40	6 (26.1)	
41 – 45	4 (17.4)	
46 – 50	3 (13.0)	
<i>Level of education</i>		
Less than high school	0 (0.00)	
High school or equivalent	3 (13.0)	
Some college	5 (21.7)	
Bachelor's degree	13 (56.5)	
Master's degree	1 (4.3)	
Professional degree (MD)	1 (4.3)	
<i>Household income</i>		
Under \$19,000	1 (4.3)	
\$20,000- \$39,999	3 (13.0)	
\$40,000-\$59,999	10 (43.5)	
\$60,000-\$79,999	3 (13.0)	
\$80,000 and more	6 (26.1)	
<i>Mother's length of time in the original country (years)</i>		16.14 (11.21)
<i>Mother's length of time in the United States (years)</i>		15.78 (9.30)
<i>Mother's body mass index (BMI)</i>		28.12 (5.73)
< 18.5 (Underweight)	1 (4.3)	
18.5 – 24.9 (Normal weight)	5 (21.7)	
25 – 29.9 (Overweight)	7 (30.4)	
≥ 30 (Obese)	10 (43.5)	
<i>Children at home</i>		3.52 (0.91)
<i>Child's age (years)</i>		8.04 (1.54)
6-8	20 (52.60)	
9-10	17 (44.80)	
<i>Child's body mass index (BMI)-for-age-and-sex</i>		64.44 (0.28)
Underweight (< 5th percentile)	1 (3%)	
Normal BMI (5th - 85th percentile)	27 (73%)	
Overweight or obese (≥ 85th percentile)	6 (16%)	
Obese (≥ 95th percentile)	3 (8%)	

mothers (69.6%) (data not shown). The Arabic language was also the preferred language for speaking, reading, and writing for 18 mothers (78.3%).

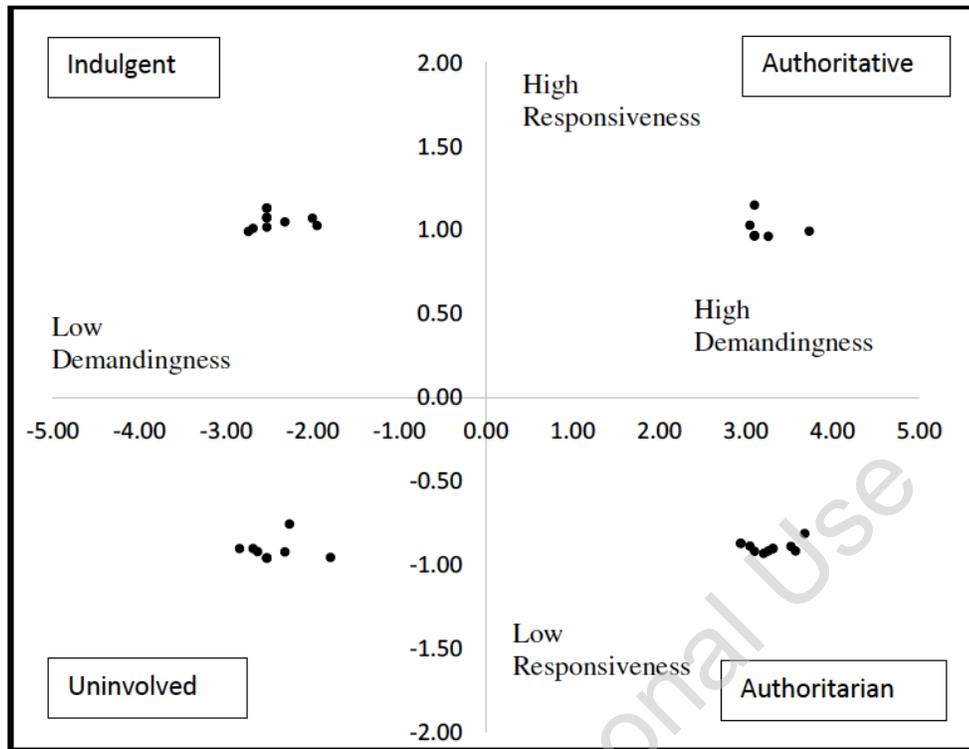


Figure 1: Participants' Parenting Feeding Styles Based on their Caregiver's Feeding Styles Questionnaire (CFSQ) Scores (n = 23).

Assessment of Parenting Style

Based on PBS, all mothers reported using the authoritative parenting style (data not shown). Twelve mothers (52.2%) reported that the source of their parenting style was themselves, while eleven mothers (47.8%) reported their parents as the source of their parenting style. Fifteen mothers (65.2%) reported that they changed their parenting style after coming to the US. Based on their responses to the CFSQ, mothers' parenting feeding styles were categorized as: *eleven Authoritarian, ten Indulgent, nine Uninvolved, and seven Authoritative* (Figure 1).

In Kendall's tau correlation analyses, the child's BMI z-scores were significantly correlated with the mother's BMI ($r = 0.325$, $p = 0.005$). The FNPA scores varied between 1.90 and 3.80, indicating a range of high-risk family environments and behaviors (obesogenic) and favorable family environment and behaviors (non-obesogenic). The overall mean across all participants was 3.15, a relatively high score that indicated favorable practices and environments. However, no significant associations were found between the means of reported obesogenic family environments and behaviors (FNPA) and child's BMI z-scores ($r = -0.083$, $p = 0.478$).

Focus Group Discussion Findings

Barriers to Child's Physical Activity

Most mothers wanted their children to be more physically active and shared challenges related to increasing physical activity in their children. Some mothers noted that participating in physical activities as a family was limited as everyone in the family had their own schedule. One said, "We travel in the summer, and during the school year, they (her children) go to the mosque four times a week. So, there is no time for sports." A few mothers mentioned the weather barrier as well, and that weather might limit their children's outdoor activities. A mother stated that her children would refuse to play basketball in their front yard when the weather is hot.

Technology (watching television or playing videogames) was mentioned by the mothers as distractions or barriers to physical activity among their children. A mother said, "We have a basketball hoop at the front yard, and my kids used to play at least an hour a day. However, when videogames are around, they don't like to play basketball anymore." Another mother stated that her children spent so much time on television, iPad, and Sony PlayStation, and that upsets her. A few mothers complained that their children were "lazy" and did not like to do physical activities. A mother

stated that her 7-year-old child would not move a lot, and sometimes, his parents carried him so he would not have to climb the stairs. Another mother said that she enrolled her 9-year-old son in soccer and basketball teams, but he did not run around as much as his team members.

A couple of mothers shared their conflict with the type of physical activity their daughters might be interested in. A mother said that her daughter had been asking her to enroll in a ballet class. However, she rejected the idea because she was afraid that her daughter would like it and would be required to wear the typical ballet attire that would be inconsistent with her beliefs regarding modesty in dress. A need to protect daughters was also noted as another mother stated, "I don't like that my girls go to the gym. I prefer to be with them wherever they go." In addition, two mothers revealed how their fear might limit their children's physical activity. A mother stated, "I don't like going to parks. I have five kids, and I need to keep an eye on them by myself." Another mother also said that she would not let her ten-year-old son play in the neighborhood because she felt it was not safe.

Mothers' Practices for Child's Physical Activity Behaviors

Mothers were asked what practices they used to encourage their children to be more physically active. Some mothers stated they helped their children find the right sport for them and meet their interests. A mother said that her nine-year-old daughter did not like sports and added, "We tried different sports until we found something she liked, which was soccer, and she got enrolled in a team." Several mothers indicated getting directly involved with their children in physical activity. A mother said, "I sometimes play with them to encourage them to be more active, so we run and jump together, and that makes them so happy." Additionally, several mothers mentioned walking with their children in their neighborhood (when the weather was nice) and walking in the mall. Moreover, a mother emphasized that she would encourage her children to be active and explain to them how important physical activity is. She said, "I always tell my kids that physical activity is important for their future, and how they have to take care of their health at this young age."

Additional Information Requested by the Arab Mothers

Almost all mothers agreed that they needed different effective strategies and resources regarding parenting styles, in general, and to develop healthier

physical activity habits, specifically. A couple of mothers would like to get different ideas about indoor physical activities that involve the whole family and encourage even themselves to be active with their children.

DISCUSSION

Although childhood obesity is a multifactorial issue, home environment, and parenting styles and practices play a major role in the child's physical activity behaviors [24-26]. This study sought to explore parenting styles/practices and family contributors to the development of obesity in Arab children living in the US using a mixed-methods design.

The Relationships between the Mothers' Weight Status, Children's Weight Status, Maternal Feeding Style, and Obesogenic/Non-Obesogenic Family Environment

The correlation analyses showed that the mother's BMI was significantly correlated with the child's BMI z-scores. This relationship has been supported by several cross-sectional and longitudinal studies [27-30], with maternal BMI being a particularly significant predictor of BMI z-scores in children ages 6-13 years old [31].

Arab Mothers' Parenting Styles Related to Physical Activity Behaviors

Based on the CFSQ's dimensions of demandingness and responsiveness [32, 33], the mothers' median demandingness score was 2.84, while the median responsiveness was 0.96. Comparing these results with other populations, Whites, African Americans, Hispanics, and Latin Americans [32, 34-37], the Arab mothers showed high demandingness and somewhat lower responsiveness (Table 2). A systematic review suggested a positive relationship between authoritative parenting styles and physical activity [38]. Generally, it is believed that the parenting style of Arab ancestries tends to be authoritarian [39]. In the current study, even though all the Arab mothers assessed themselves in the PBS and mostly assessed themselves in the FGD as authoritative, the CFSQ indicated that these mothers' parenting styles encompass all four categories.

The FNPA mean total scores in this study varied between 1.90 and 3.80, indicating scores that ranged from obesogenic to non-obesogenic. However, the overall mean across all participants was 3.15, which

Table 2: Caregiver's Feeding Styles Questionnaire (CFSQ) Median Scores on Demandingness and Responsiveness Across Different Populations

	N	Ethnicity	Child's age (years)	Demandingness*	Responsiveness*
Tami & Reed, 2020	23	Arab	6-10	2.84	0.96
Hughes <i>et al.</i> , 2005	231	African American, Hispanic	3-5	2.79	1.16
Hughes <i>et al.</i> , 2008	718	African American, Hispanic, White	3-5	2.79	1.17
Hennessy <i>et al.</i> , 2010	99	African American, Hispanic, White	6-11	2.63	1.21
Hughes <i>et al.</i> , 2011	177	African American, Hispanic	3-5	3.00	1.14
Tovar <i>et al.</i> , 2013	140	Haitian, Brazilian, Latin American	3-12	2.89	1.12

*Demandingness: refers to how much the mother controls and encourages a child's eating (the total mean of the 19 items); responsiveness: refers to how much the mother accommodates and acquiesces to child's hunger and satiety cues (the mean of 7 items -child-centered: 3+4+6+8+9+15+17- over the total mean score).

indicated favorable family practices/behaviors and environments. In other research, higher or more favorable scores were reported in higher-income families (when scores were stratified by income) and in Caucasian families (when scores were stratified by ethnicity) [14].

Arab Mothers' Barriers and Practices Related to Physical Activity Behaviors

Regarding physical activity, the mothers reported barriers to their own involvement but also reported positive practices to promote their children's physical activity behaviors. Insufficient time to enroll their children in sports and inclement weather were the most frequently mentioned barriers. This is consistent with other studies that reported parental barriers to support an increase in children's physical activity [26, 40, 41]. Additionally, some mothers reported that their children were deterred from being physically active due to distractions by technology (watching television or playing video games). This is consistent with the literature that reported technology as a barrier to physical activity [42-44].

Protective cultural practices that limited daughters' physical activity was reported by a couple of mothers in the study. Such a protective action was reported in another culture (e.g., African American) in a study by Gordon-Larsen *et al.* [45]. This study on young African American girls found that caregivers perceived television viewing positively, as it was a method of safe supervision of their daughters. In the current study, maternal safety concerns about playgrounds in public parks also limited their children's physical activity.

However, some mothers in this study believed in the importance of physical activity and tried to influence their children through discussion with them, enrolling

them in sports, and direct involvement in different physical activities with their children. These methods of logistical support of a child's physical activity (enrolling in sports and driving them to events) and explicit parental modeling have been identified as positive parental contributions to the child's activity practices [46]. In addition, a systematic review that included several qualitative studies suggested that parental involvement, encouragement, and modeling of physical activity would influence a child's physical activity [47]. Such positive practices effectively impact and encourage the child to be physically active in the short and long-term. Table 3 shows the application of the SCT to selected Arab mothers' parenting styles/practices related to physical activity behaviors and provides educational strategies that may be used to address needs.

Study Limitations and Strengths

The findings of the three survey assessments and FGD of this study should be interpreted within the context of the study limitations. Even though the study sample included a diverse group of Arab mothers, results cannot be generalized to all Arab mothers living in Texas or the US. The surveys used in this study did not include a question regarding how the mothers perceived their child's weight status in terms of favorable or unfavorable. This might impact the study results since the mothers' perceptions of their children's weight might influence their willingness to make changes in the children's diet and physical activity [48, 49]. Furthermore, children's heights and weights were not measured directly by the study investigators but were self-provided by the mothers. Many factors can influence a child's weight, but the cross-sectional nature of the study data does not allow for an investigation of changes over time. Also, children's physical activity was not assessed using objective

Table 3: Social Cognitive Theory and Selected Arab Mothers' Parenting Styles/Practices Related to their Children's Physical Activity Behaviors and Possible Educational Strategies

Social Cognitive Theory Constructs (17,18)	Parenting Style	Illustrative Quotes	Educational Strategies
<i>Reciprocal Determinism:</i> The dynamic interaction of the person, behavior, and the environment in which the behavior is performed	Authoritative Authoritarian	"We tried different sports until we found something she liked, which was soccer, and she got enrolled in a team." "I don't like that my girls go to the gym. I prefer to be with them wherever they go."	Parents need the education to maintain a division of responsibility of creating healthy lifestyle environments, introducing their children to a variety of physical activity choices, and being role models by being physically active. Children enjoy doing physical activities with their parents.
<i>Behavioral Capability:</i> Knowledge and skill to perform a given behavior	Authoritarian	"My daughter (you know girls) has been asking me to put her in ballet, and I'm doubting and don't want to because as you know, we are Muslims, I'm afraid that she would like it when she grows up, and because of what they (ballet dancers) wear.	Parents need to learn how to introduce their children to a variety of physical activity options, considering their interests/preferences, and educate them about the health benefits of physical activity.
<i>Expectations:</i> Anticipated outcomes of a behavior	Uninvolved	"We are more focused on the older ones' weight. So, they are enrolled in different sports... the little ones, I tried to enroll them in sports, but they just didn't like it. However, they are physically active and slim."	Educational messages to parents should include how to help their children to find the right sports for them and encourage their children to engage in physical activity behaviors that meet their interests.
<i>Self-Efficacy:</i> Confidence in one's ability to take action and overcome barriers	Indulgent/permissive	"I don't like going to parks. I have five kids, and I need to keep an eye on them by myself. I get so nervous even if I go with a group. So, I hesitate a lot before I decide to take them to the park."	Parents need to feel confident that they are able to offer a variety of culturally appropriate and safe ideas for physical activity to their children based on interests/preferences. Culturally suitable examples (stories, case studies, videos) about how other parents overcame barriers to healthy food and physical activity choices may be helpful.
<i>Observational Learning:</i> Behavioral acquisition that occurs by watching the actions and outcomes of others' behavior	Authoritative Indulgent/permissive	"I sometimes play with them to encourage them to be more active, so we run and jump together, and that makes them so happy." "We travel in the summer, and during the school year, they (her children) go to the mosque four times a week. So, there is no time for sports."	Educational messages for parents should include an explanation of the power (positive and negative) of key influencers on their children's health behaviors (parents, siblings, and peers).
<i>Reinforcement:</i> Responses to a person's behavior that increase or decrease the likelihood of behavior reoccurrence	Authoritative	"I always tell my kids that physical activity is important for their future and how they have to take care of their health at this young age."	Parents need to learn that through repeated exposure of different physical activity, preference of these physical activities may occur among their children.

measures, such as pedometers, heart rate monitors, accelerometers, or direct observation [50].

CONCLUSION

Despite these study limitations, this study's use of mixed methods provided a unique understanding of the effect of parenting styles/practices and home environments of Arab mothers related to their children's physical activity behaviors. The qualitative methods used provided critical information regarding knowledge gaps, attitudes, and beliefs, needed for designing

physical activity programs targeted at Arab families. This information should aid in further efforts to investigate the effect of parenting styles/practices and home environments of Arab mothers on their children's physical activity behaviors in the US and the development of nutrition education programs for immigrant parents.

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