

Formative Evaluation of a Pilot Study of a University Exercise Class for Female Muslims

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Abstract Young adult Muslim women in western societies encounter barriers to exercise participation due in part to a lack of gyms offering women-only classes. Among university students, exercise might be further compromised by competing demands on time due to academics/work. We piloted a women-only exercise program (Sisters Exercising Together) for Muslims at one university in the southwest United States during the 2016-2017 academic year. We used attendance rosters ($n = 6$ participants), and focus group interview ($n = 3$) and informal interview ($n = 47$) techniques to assess the feasibility of and satisfaction with the program and to determine reasons for (low) attendance. Although conceptually well-received, intrapersonal factors related to perception of time, personal preferences, and motivation were most responsible for non-attendance. Potential courses of action for improving attendance should focus on improving self-regulation skills and enhancing social support.

Keywords: religion, female, physical activity, college, program evaluation

Cite This Article: David Kahan, Hamza Amini, and Maryan Osman, "Formative Evaluation of a Pilot Study of a University Exercise Class for Female Muslims." *Journal of Physical Activity Research*, vol. 3, no. 1 (2018): 35-40. doi: 10.12691/jpar-3-1-6.

1. Introduction

Most American college students do not currently meet recommended guidelines of 150 min/week of moderate physical activity (PA) (79.4%) or 75 min/week of vigorous PA (84.3%) [1]. Sufficient PA in adolescence (i.e., age associated with the start of college for many) reduces the risk of morbidity in adolescence and tracks into adulthood [2]. Differences in PA levels exist among university students based on gender and race with male and White students accumulating more PA than females and non-Whites [3,4]. These disparities are concerning, as university PA classes are associated with increased overall PA and improved mood [5].

Female Muslim students represent a subpopulation that may be particularly vulnerable to low levels of PA during college, because generally, exercise participation for many Muslim women is contingent on the availability of private, women-only spaces [6]. In New York City, for example, male and female Bangladeshis expressed that: 1) It was culturally inappropriate for women to engage in PA openly and in public spaces; 2) community venues deemed acceptable for PA were scarce; 3) mixed-sex participation was for non-Muslims (i.e., not for Muslims); and 4) women-only classes taught by women mitigated the problem [7]. In Minnesota, lower engagement by Somali adolescent girls in certain types of PA, compared to their male co-religionists and female non-Muslims, was partially attributed to cultural beliefs that discouraged co-participation in sport with or being watched by males and clothing restrictions for preserving modesty [8].

In non-Islamic countries, a variety of personal, interpersonal, cultural, religious, and environmental variables may influence PA behavior among Muslim females [9,10]. For example, 6 Muslim Arab female undergraduate students cited lack of parental support, encouragement, and modeling and friends' support as factors that influenced PA [11]. These same women also cited varying degrees of flexibility toward adapting to PA facilities/opportunities that were constructed and planned with non-Muslims in mind [11]. As a result, it is not surprising that among 214 Middle Eastern-American university students 29.3% of females vs. 43.9% of males averaged $\geq 10,000$ steps/day over 1 week [12]. Such disparity is concerning because physical inactivity is associated with various lifestyle diseases (e.g., diabetes, hypertension, overweight) whose prevalence among Arab Americans – one-quarter of whom are Muslim [13] – have been observed to be as great or greater than non-Arabs [14].

Therefore, interventions are needed that specifically target barriers to PA encountered by Muslim women – particularly the problematic of mixed-sex exercise classes. Although we found no published reports on PA interventions that catered to Muslim women in a university setting, the news media have reported on PA classes, gym hours, and spaces for women-only initiatives designed to accommodate Muslim students at schools such as Carleton University [15], George Washington University [16], and Harvard [17]. Systematic evaluations of these and similar programs, however, are absent from published research literature. Evaluations of pilot study interventions allow for identification of and reflection on what works and does not, so that effective intervention

components may be retained/bolstered and weaknesses minimized/eliminated [18].

The purposes of our pilot study were to 1) quantify participation in, and qualify feasibility of and satisfaction with a women-only exercise program on a university campus (Sisters Exercising Together [SET]), and 2) identify reasons for low and non-attendance.

2. Methods

2.1. Background

Although there are no data about the number of Muslim students attending San Diego State University, from 2000 to 2010, the Muslim population in San Diego County grew by 179% to 22,000 people [19], and hijabis (women who wear the Muslim headscarf) are commonly seen on campus. An active Muslim Student Association (MSA) exists on campus, and over time, various cultural student groups that include Muslims have existed such as Arab, Kurdish, Kuwaiti, Saudi, and Somali Student Associations.

2.2. Recruitment

In May 2016, we met with several prospective SET participants, to discuss and determine whether there was an interest in SET and to plot participant recruitment logistics in the months leading to fall semester 2016. The co-authors who are Afghan male (HA) and Somali female (MO) proceeded to contact friends and acquaintances through social media and face-to-face contact and by word-of-mouth. For example, author HA invited 10 female acquaintances through Facebook who in turn invited 28 of their friends to participate in SET. We made presentations at a Somali community health fair and MSA Friday prayers and meetings and contacted campus and community gatekeepers (e.g., MSA president, Center for Arab and Islamic Studies, Student Intercultural Association, imam of San Diego Islamic Center), so that they in turn could disseminate news of the impending program. We relied on word-of-mouth to further spread news of the program (i.e., snowball sampling), which has been successfully used among this demographic [20]. In the spring 2017 semester, we added additional recruitment approaches. On Facebook, we posted the class schedule for the month and regular reminders about and invitations to followers of SET, uploaded videotaped greetings from and introductions of instructors, paid to boost posts to the greater Muslim community, and sought and got approval from the imam ("Liked" us) of the central mosque in San Diego.

2.3. Program Description

We offered SET during fall semester 2016 on Tuesdays and Thursdays from 3-4 pm in a reserved, secure gym space located in an academic building on campus. Planned exercise formats included aerobics and strength, barre, boot camp, dance, pilates, spinning, TRX and yoga. Fees were set at \$50 for the semester. The University Rec Center staffed one class session and we hired a female undergraduate student exercise science major to staff the other.

Over the winter break we conducted a needs assessment through Survey Monkey or face-to-face with (prospective) participants ($n = 19$) in order to obtain feedback for informing the structure and scheduling of spring classes. We subsequently scheduled spring SET classes 3 days/week on Mondays (7 pm), rotating Thursdays (5:30-6:30 pm) and Fridays (6 pm), and rotating Saturdays (10 am), and Sundays (10 am) every 2 weeks. We scheduled various class formats including martial arts/self-defense, strength and conditioning, hip-hop dance, and Latin dance. We set a price of \$100 for the semester or \$5 per class. We hired five instructors – all female undergraduate exercise science majors – to teach classes based on individual expertise.

2.4. Data Sources and Analyses

Overall, we used a mixed-method multi-source approach to collect data. The San Diego State University Institutional Review Board (Protocol No. 1848097) approved the study. Author MO took roll each class to assess participation trends. We calculated descriptive statistics to determine class and individual participation rates and patterns. We gained informed written consent from 6 attendees who elected to have their PA and post-exercise mood state measured or wished to participate in an end-of-semester evaluative focus group. We refer to such attendees hereafter as *participants* (i.e., to distinguish them from SET non-participants). They completed a demographic questionnaire on which they supplied their age, height and weight, ethnicity, religiosity [21], acculturative status [22], and frequency of engaging in PA the previous week.

In late November, the primary author conducted a focus group interview with the 3 participants who attended a majority of classes. Interviewees had known the primary author for 2 or more months and indicated they were comfortable being interviewed by a male. The interview followed a semi-structured format and consisted of five reflection questions (e.g., What were your reasons for attending SET? What facilitated/posed barriers to participating in SET?), and four evaluative questions (e.g., How did SET accommodate your religious beliefs regarding requirements for participating in exercise? What did you like most/least about SET?). The audiotaped interview was conducted in a private conference room, lasted 42 min, and was transcribed verbatim. To enhance trustworthiness, we employed real-time member checking (i.e., interviewer summarized responses for participant verification) and returned the transcript for participant feedback [23]. We conducted thematic analysis [24] to examine response patterns for each question and discussed thematic trends in the data to consensus.

There were 67 women who were originally contacted or learned about SET through face-to-face contact ($n = 44$), Facebook ($n = 11$), email ($n = 9$), and Snapchat, mobile text, and flyer ($n = 3$). They included participants and non-participants. We suspended SET classes due to low attendance (March 1, 2017), and HA, MO, and two Muslim female assistants proceeded to re-contact the 67 women to ask for a reason or reasons for non-participation. Terse answers such as "work" or "school" were followed-up with the probe: "What about school/work prevented you from attending?" Forty-seven women

responded through face-to-face contact or social media and descriptors reported herein refer to respondents by general ethnic identity (Arab, East African, South Asian, Other) and hijab status (hijabi, non-hijabi). Their responses were immediately noted but not audio-recorded. The primary author and author MO independently conducted qualitative content analysis using a directed approach [25], which was theoretically informed by the socio-ecological model—intrapersonal, interpersonal, environment, and policy levels [26]—for coding and organizing responses. The socioecological model presupposes that individual level behavior (attending SET class in this case) influences and is influenced by proximal (e.g., parents, family, friends) and distal (e.g., environment, policy) factors.

3. Results

3.1. Participants of SET

Six women attended at least two entire class sessions during the fall semester. Participants were comprised of five students between the ages of 19 and 21 and 1 faculty. Self-identified ethnicities included Somali and Iraqi ($n = 2$ each) and Arab and Indian ($n = 1$ each). Five of six participants had BMI values classified as overweight with two of those classified as obese. Five of six participants considered themselves religious and majorities considered themselves at least moderately acculturated and highly integrated. For the previous week, 66% engaged in at least 30 min of moderate PA, 33% engaged in at least 20 min of vigorous PA, and 16.7% engaged in strength training exercises.

3.2. Participation, Feasibility, and Satisfaction

We offered 24 classes during fall semester. Participants attended between two (12%) and 23 (96%) classes. Two participants attended $\geq 75\%$ of classes while all others attended less than 30%. One attended only three classes as an exercise participant; however, overall she attended all but one class in her role as data collector/class manager. Class attendance averaged 2.5 ± 1.4 participants and ranged between 1 ($n = 5$ sessions) and 6 participants ($n = 1$ session). Modal class participation was 2 participants ($n = 11$ sessions).

Analysis of the focus group interview of regular participants revealed that our impetus for offering the SET program corresponded with participants' reasons for initial attendance. All three participants indicated they were attracted to SET because it would reduce barriers to participating in exercise.

I used to go to a women's gym that got shut down.... I wanted to work out. So as soon as I heard about it, I was all for it....I felt very intimidated just looking at it [University Rec Center] just because there were absolutely no women in the weight room. It was weird. (Arab hijabi)

I love working out and I heard it's only for girls, private. (Arab non-hijabi)

I was already working out on campus but I never felt comfortable enough to really enjoy myself. (East African hijabi)

We specifically designed SET to appeal to university Muslim women. Yet while participating in classes the participants were not overly cognizant of their identity as Muslims.

As class progresses you get so kind of used to the routine you don't consciously think about it all the time. Now it's like class with people I know, class with instructors I like, and you forget that at the end of the day it's all because I am a Muslim woman. (East African hijabi)

All participants offered unconditional approval of SET's accommodation of religious beliefs, class content, and camaraderie. However, their evaluation of class setting was mixed, and they unanimously criticized the schedule:

Accommodation — I wear the head scarf, so it saves me there, but when it comes to outfits, a lot of the time when I am at a public gym, like the URC on campus, I have to wear outfits that aren't too tight, not too loose, not too eye catching. But with SET because it gives me an environment where it's girls only and I feel comfortable. (East African hijabi)

Class content — I love everything honestly. I love all the workouts we've done so far, but the most that has really stood out to me is the self-defense class. (Arab hijabi)

I think my favorite thing we've done is dance because I personally like dance classes more than anything else. So that's definitely something I would want more often. Camaraderie — The highlight is that I get along with everyone. Here I got to make new friends. I love the trainers. They do a great job. (Arab non-hijabi)

Setting — I like how we didn't have see-through windows. (Arab non-hijabi)

There's a lot of room....There are different things you can do but I feel it like kind of limits us with the equipment that there is....the heaviest dumbbells were like 10 pounds. (Arab hijabi)

Scheduling — The schedule is definitely conflicting for me considering it's the middle of the day and I don't go home after I work out. (East African hijabi)

3.3. Reasons for Non-attendance

After suspending the program, we sought reasons for non-attendance, which we obtained from 47 lapsed- and non-attendees (see Table 1). Based on the socioecological framework the frequency of reasons for non-attendance was highest at the intrapersonal level ($n = 60$), which was twice that of interpersonal, policy, and environment levels combined (Table 1). We observed response differences based on hijabi vs. non-hijabi status but not for ethnic identity. Specifically, non-hijabis seemed far more likely than hijabis to state that they were comfortable going to a gender-mixed gym and therefore were not as interested in the program. The most common themes under the intrapersonal level, indicated in regular font in Table 1, consisted of perceptions of time ($n = 25$), personal preferences ($n = 15$), and motivation ($n = 12$) as deterrents to attendance. The most common subthemes, indicated in italics in Table 1, consisted of prioritizing school over attending SET ($n = 11$), and prioritizing work over SET and already working out at a traditional gym ($n = 8$, both).

Table 1. Reasons for Lapsed- or Non-attendance at SET Classes, San Diego, CA 2016-2017 (n = 47).

Ecological level (N)		Sample Quotes
Theme (n)	Subtheme (n)	
Intrapersonal (60)		
Health problems (1)		
Lack of knowledge (6)		
	<i>Gender of class instructor</i> (1)	I hadn't known that classes on the weekend were also offered. (East African hijabi)
	<i>General SET program</i> (2)	
	<i>Weekend class availability</i> (3)	I wasn't too aware of the programming as far as what they were doing et cetera. (South Asian non-hijabi)
Motivation (12)		
	<i>Lacks energy/tired</i> (4)	
	<i>Lacks motivation/interest</i> (4)	And by the time there is a SET session I'm exhausted and just want to sleep and go home. (Arab hijabi)
	<i>Laziness</i> (2)	
	<i>Requires too much effort</i> (2)	On the weekends I want to relax instead of coming to school. (Arab hijabi)
Perception of nighttime safety (1)		
Perception of time (25)		
	<i>General business</i> (6)	It was my first year and I was still adjusting to my schedule and I wanted to keep up with all my classes. (Arab hijabi)
	<i>School/academic priorities</i> (11)	I overwhelmed myself this semester with a new job (Arab hijabi)
	<i>Work priorities</i> (8)	
Preferences (15)		
	<i>Desire for static class schedule</i> (2)	Workouts were in the evening and I liked to workout in the morning. (Other non-hijabi)
	<i>Exercise alone</i> (1)	
	<i>Regular exercise time not accommodated</i> (4)	I knew how to workout and had a workout routine so I didn't really want to do any of the classes. (South Asian non-hijabi)
	<i>Currently working out at traditional gym</i> (8)	
Interpersonal (12)		
Household (7)		
	<i>General prioritizing of family</i> (3)	You know my parents and how strict they can get if I'm out of the house for something other than school and my older brother isn't there. (Arab hijabi)
	<i>Parental/sibling contingencies</i> (2)	My mom goes to work and school and depends on me to baby-sit and take care of the kids. (East African hijabi)
	<i>Sibling care responsibilities</i> (2)	
Lack of friends to co-participate (5)		I wanted to join but I didn't have any friends who were interested. (Arab hijabi)
Environment (7)		
Transportation mode (2)		
	<i>Bus reliant</i> (1)	
	<i>Car problems</i> (1)	I take the bus and it was inconvenient for me to come workout on weekends. (East African hijabi)
Transportation perceptions (5)		
	<i>Driving distance too far</i> (2)	Even if classes were free, parking would be an issue. (East African hijabi)
	<i>Parking too difficult</i> (2)	Commuting back to State with traffic is too much because I am coming from downtown. (East African hijabi)
	<i>Traffic too heavy</i> (1)	
Policy (11)		
Class times directly conflict with schedule (7)		Because of the timing of the gym classes – in the evening around 8pm in which I had school classes. (Arab hijabi)
Price too high (4)		The price was the primary reason I did not join. I couldn't afford it. (East African hijabi)

4. Discussion

PA interventions conducted among general populations of university students significantly increase levels of moderate PA [27]. We designed SET to alleviate cultural/religious barriers to exercise for university Muslim women. Although chronic low- to non-attendance characterized SET, formal and informal interview results suggest it was conceptually well received by participants and non-participants alike, which bolsters the imperative that such settings be created [28].

From a socioecological framework perspective, intrapersonal factors played the largest role in getting prospective participants “through the door,” and keeping them coming back. Indeed Suminski and Petosa [29] found high percentages of ethnic minority university students to be in precontemplative or contemplative stages of change for exercise. Movement to preparation and action stages relative to initiating and maintaining participation in programs such as SET may be assisted by support from significant others such as parents and friends [30] and potentially from clergy such as an imam [31]. Classes offered in

conjunction with a pre-established student group's (e.g., MSA) religious gatherings or social functions—if setting logistics are culturally amenable—may also prove acceptable. Gaining the early backing of an imam who actively models PA and promotes it across various platforms (sermons, lectures, counseling, social media) may be persuasive [32].

The characteristics of Muslim female students we encountered were much like those previously described for the general university population [30]. Specifically, university students 1) cope with self- and time-management skills independent from their parents' direction for the first time; 2) often juggle class and work schedules; 3) have a high degree of variability in their schedules over a semester and between them; and 4) on weekends catch up on schoolwork or have their routines disrupted by family or social events [30]. Indeed, results of previous research with a primarily female sample of college students suggests that work status was negatively associated with initiating PA [33]. In another study of more than 500 college students, half of whom were female, those that took a course overload (>16 units) reported 90 min/week less vigorous PA than those who took a normal load [34].

As such, commitment to a fixed exercise class schedule over a semester may not have been feasible for most, and those who were already gym members had the luxury to exercise at their convenience. Perhaps women-only hours at a university gym that includes flexible scheduled classes led by a Muslim equivalent of a Latina promotora [35] can alleviate some of these obstacles.

Female college students, compared to males, demonstrated lower ability to set goals (ES = 0.57) and plan (ES = 0.38) for PA [36]. Moreover, among a sample of college students composed of 70% females, higher scores on these factors directly resulted in higher levels of PA [37]. Thus, counseling, peer mentoring, and wellness/PA courses for credit should be offered and focus on improving various aspects of self-regulation such as setting goals, planning for exercise, and overcoming scheduling conflicts. Such approaches work particularly well among female college students. In a peer education intervention, women in the treatment group classified as inactive compared to those in the control group, increased PA from pre- to posttest (+29.0 vs. -96.0 min/week) [38]. In a university course that taught behavior change skills in weekly lectures and peer-led labs, women in the intervention group – but not men – increased leisure-time total PA [39]. These same women had significantly higher experiential (e.g., consciousness raising, self-reevaluation) and behavioral processes (e.g., counter conditioning, stimulus control) of change scores 2 years later [40].

4.1. Limitations

We utilized multiple methods to gain insight into the processes of a university exercise program tailored for Muslim females – the first such report in the literature. There were, however, a number of limitations. First, there was no systematic way to identify prospective SET participants (i.e., records of students' religious identification are not kept and if they were could not be released by law) nor means to advertise the program to all eligible students across the university. Thus, findings represent a convenience sample with some elements of snowball sampling, which otherwise has proved successful in recruiting this population in PA research in a university setting [20]. Second, we had relatively few SET participants, although we gained substantial feedback from non-participants. The study required participants to pay for exercise classes versus other studies that are either free or compensate participants. We may have been able to get a larger sample of participants had we offered free classes or compensated participants, but such a model is not sustainable nor authentic in the context of for-profit university auxiliaries that might offer similar programming. Third, the university and city environments relative to the number of Muslim students and citizens, prevailing attitudes, and social welfare programs and amenities available to them may differ from other large universities and metropolitan areas in the USA. We encourage other universities with substantial Muslim populations to trial similar programs.

5. Conclusion

Universities are fertile grounds for behavioral health promotion as their students undertake a life transition that

increases the risk of physical inactivity [41]. Islam specifically enjoins its followers to “strengthen the body...especially through exercise” [42], p. 24]. Commitment to religious pluralism at US universities supports efforts to provide religiously/culturally compatible access to exercise and recreation classes and venues for diverse student populations. Even after consulting with students and accounting for their preferences, a “build-it-and-they-will-come” mentality may prove insufficient to promote exercise engagement and maintenance. Additional, concerted efforts to help such students overcome intrapersonal barriers that hinder exercise adoption, especially those that systemically tap into interpersonal and organizational elements of the student experience [43], should bolster programs such as SET.

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