BENEFITS AND BARRIERS TO PHYSICAL ACTIVITY AMONG SAUDI FEMALE UNIVERSITY STUDENTS IN THE KINGDOM OF SAUDI ARABIA AND THE UNITED STATES

By

Maali Saud Alsahli

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Thesis Committee:

Dr. Donald Belcher, Chair

Dr. Scott Colclough

This work is dedicated to my mom, Al Jazi, you are the motivation for completing my thesis. You have always been proud of me and encouraged me to finish my studies and take educational opportunities you did not have. Without you, I could not achieve my goals.

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ABSTRACT

Regular physical activity is known to have vital benefits for individuals. Consequently, it is important to know if people understand the benefits of physical activity and barriers that prevent them from being physically active. Previous research indicates that Saudi female university students do not engage in regular physical activity. However, there is little research on this demographic. Therefore, the objectives of this study were to assess the perceived benefits of physical activity and determine the most common barriers to physical activity among Saudi female university students in the Kingdom of Saudi Arabia (KSA) and the United States. The Health Belief Model was utilized to guide this research. Data was collected from 211 female students from Hafr Al batin University (UHA) in KSA and Middle Tennessee State University (MTSU) in the USA using the Exercise Benefits / Barriers Scale (EBBS).

The results of the t-tests showed no significant difference between participants in the KSA and USA regarding the strength of their Exercise Benefits; however, the strength of Exercise Barriers was greater among female Saudi students attending university in the USA. Pearson's Chi-Square tests revealed an association between school of attendance (KSA or USA) and both membership to a sports club and studying PE / Health Education, whereas school of attendance had no association with participating in a PE/Health workshop.

Mann-Whitney tests showed no significant difference in days of exercise between the two groups, but did show a difference in duration of exercise. A partial least squares path analysis indicated that Exercise Benefits and Barriers were predictors of days of exercise per week, while school of attendance was not. Moreover, School Attendance, Exercise Benefits, and Exercise Barriers were predictors of duration of exercise.

This study indicates that while both groups have awareness of the benefits of physical activity, they also face unique barriers. Policy change needs to be enacted in order to facilitate physical activity behaviors for Saudi female university students, and research should utilize a Plan-Do-Study-Act cycle to assess interventions for this subset of the population.

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INTRODUCTION

The basis of this study will help to establish the importance of physical activity in different subsets of the population, and more specifically the relationship between physical activity and the perceived benefits and barriers of Saudi female university students. The study will then go on to provide implications for social action and future research to mitigate barriers and increase the knowledge of benefits among Saudi female university students.

Regular physical activity benefits the population at large (Munford, 2011). Concrete benefits of physical activity include chronic illness prevention and mood enhancement (Tyson, Wilson, & Crone, 2010; U.S. Department of Health and Human Services [DHHS], 2010). Participating consistently in physical activity has been correlated to better health physically and psychologically (Centers for Disease Control and Prevention, 2006). Furthermore, engaging in moderate and vigorous levels of physical activity can lower the risk of premature death and chronic illnesses (DHHS, 2010). The current recommendation for physical activity in adults in a minimum of 150 minutes of moderate physical activity per week. However, it is reported that consistent physical activity rates were very low among adults (less than half of the population) regardless of the benefits (USDHHS, 2010).

Low participation rates are a concern for the Kingdom of Saudi Arabia (KSA). Nearly half of the population is inactive, and the country lacks the infrastructure to encourage higher rates of physical activity for all subsets of the population (Alghenaim, 2013; Al-Hazzaa, 2004). Larger cities like Riyadh and Jeddah have sports clubs and other places for physical activity, but they are not open to women. Women in the KSA are discouraged from physical activity in two major ways: until recently, there has been no physical education for girls k-12, and schools are

segregated by gender, meaning that females are taught in entirely different buildings and not offered physical education. In fact, all of the universities in Saudi Arabia require separate male and female buildings in two different locations. Most physical education funding is allocated to buildings that are designated for male students because they are given facilities for physical activity unlike female students.

University students, much like the general population, do not participate in adequate rates of physical activity (DHHS, 2000; Raynor & Jankowiak, 2010). In the Middle East, physical inactivity is especially prevalent. For example, Awadalla et al (2014) found that Saudi students attending King Khalid University have a physical inactivity rate of 58%. In general, males are more active than females, and women tend to be less physically active as they age (Sherwood & Jeffery, 2000). Males also report less barriers to physical activity (Munford, 2011). In the Middle East, physical inactivity rates for men were at 36%, whereas women had physical inactivity rates at 50% (World Health Organization [WHO], 2008). This is especially relevant in Saudi Arabia, where gyms and recreation centers on campus are only located in the males' buildings which is segregated from women's buildings. Another barrier for female Saudi university students is the elective health and physical education classes themselves. These classes are lecture-based and do not have any practical component, eliminating another opportunity for female students to be physically active. Physical activity rates, along with perceived benefits and barriers to physical activity, have not been extensively studied among Saudi female university students, but demographic data on physical activity rates suggests that they are likely to get insufficient physical activity.

The Health Belief Model (HBM) will be used as the theoretical framework to analyze perceived benefits and barriers to physical activity among Saudi female university students. The

HBM was chosen due to its compatibility with the Exercise Benefits / Barriers Scale (EBBS). This model is especially adept at predicting whether or not an individual will engage in a health-related behavior. Developed in the 1950s, the HBM has undergone many modifications to increase accuracy. These modifications include cues to action, self-efficacy, knowledge, and socio-demographic variables (Bandura, 1977; Burak &Meyer, 1997). Because the HBM has undergone these modifications, the instrument is less uniform as a whole (Sheeran & Abraham, 1996). However, for this study, which will utilize the EBBS instrument, the HBM is the most appropriate theoretical framework model.

The EBBS has been chosen due to its accuracy in predicting health behaviors. This instrument has a total of 43 items, 14 being related to perceived barriers and 29 being related to perceived benefits, which aim to find a correlation between perceived benefits and barriers and health behaviors. This instrument has been used successfully in previous research to determine physical activity levels in different subsets in the population. The most relevant example for this study is Samara, Nistrup, Al-Ramma and Aro's (2015) survey of first-year Saudi Arabian females attending university in Riyadh. In this instance, the results found that these women did have a high rate of perceived benefits of physical activity, but the barriers, including a lack of facilities and university support, discouraged them from engaging in physical activity. For instance, the segregation between males' and females' campuses act as barriers to physical activity for females students because physical activity facilities are exclusively located in designated buildings for males.

Because the main tenets of the EBBS instrument are perceived benefits and barriers, it is important to discuss benefits and barriers at length. Perceived barriers are obstacles that keep individuals from participating in physical activity, and can be related to external factors such as

weather or lack of facilities, or internal factors such as lack of time or motivation (Allison, Dwyer, & Makin, 1999). Understanding barriers can facilitate the creation of effective intervention by removing or mitigating those barriers. Studies have shown that perceived barriers to physical activity among university students tend to be laziness, no interest, and time constraints due to university obligations (Abdullah, Wong, Yam, & Fielding, 2005; Daskapan, Tuzun, & Eker, 2006; Mudronja, Petračić, & Pedišić, 2011). Barriers differ among female university students, particularly in the Middle East. For example, in Qatar, female athletes cited hijab, gender segregation, family encouragement, and reputation as barriers to physical activity (Harkness, 2012). For Saudi female university students, common barriers were lack of facilities and university support (Samara, et al., 2015). A high rate of perceived benefits, on the other hand, can encourage individuals to regularly participate in physical activity, and is a key factor in the EBBS instrumentation for predicting health behaviors.

For this particular study, participants will only be Saudi female students attending university in either the USA or KSA. A total of 225 students will be surveyed from Middle Tennessee State University and the University of Hafr Al batin. The participants will complete the survey after giving consent, and no identifying information will be included in order to protect confidentiality. The survey includes demographic variable data and the EBBS, modified by Darawad, Mosleh, Khalil, Maharmeh, Hamdan-Mansour, & Samarkandi (2016) for Arabic-speaking participants. Then, the researcher will collect the surveys and use SPSS data editor to analyze the results.

Ultimately, this study will determine physical activity rates among a sample of Saudi female university students attending university in the US and KSA to identify location-specific barriers or differences in perceived benefits knowledge. Once the differences are determined,

interventions can be created to mitigate common barriers and increase knowledge of benefits. Hopefully, this research will facilitate understanding of the physical activity rates and health for that subset of the Saudi population and encourage effective intervention.

CHAPTER II:
LITERATURE REVIEW

Introduction

The review of literature will first examine features and benefits of physical activity as well as health risks posed by physical inactivity. The role of physical activity in Saudi Arabia will be addressed. Literature reviewed from research done in Saudi Arabia focuses on knowledge of physical activity, gender discrepancies in physical activity, particularly for females, and the impact culture might have on physical activity rates in female university students.

First, a brief overview of physical activity, along with the benefits of physical activity, recommendations for physical activity, and how the public and private sectors in Saudi Arabia affect participation rates, will be addressed. It is worth noting that the previous research concerning physical activity affirms that regular participation in physical activity is necessary for lifetime health and wellness. This point will be stressed, emphasizing benefits such as risk reduction for chronic illnesses such as type II diabetes, stroke, and cardiovascular disease (Center for Disease Control and Prevention [CDC], 2006; US Department of Health and Human Services [USDHHS], 2010). The declining rates of physical activity will also be emphasized as a means of demonstrating the necessity of physical activity intervention (USDHHS, 2010; Robbins, Pender, & Kazanis, 2003).

The literature review serves as a foundation for this study. Research will determine the knowledge that Saudi female university students have regarding physical activity, along with their perceived benefits, and barriers to physical activity. Saudi Arabian culture, rates of physical activity, health status, and knowledge of physical activity among females will be addressed at length.

Previous research on Saudi female university students' knowledge and perceived barriers to physical activity will lead this study to determine the knowledge base and most frequent barriers to physical activity among Saudi female students in an American university and a Saudi Arabian university. Furthermore, this study aims to see how knowledge of benefits and perceived barriers to physical activity affect participation. The hypothesis is that the greater the perceived barriers and the lesser the perceived benefits of the subjects about physical activity, the more likely it is that they are physically inactive.

Benefits of Physical Activity

Consistent engagement in physical activity has significant benefits for all people (Warburton, Nicol, & Bredin, 2006). In fact, regular physical activity is correlated with improved physical and psychological health (Adams, Moore, & Dye, 2007; Blaber, 2005; CDC, 2006; Tyson, Wilson, Crone, Brailsford, & Laws, 2010). Several researchers have found that participating in moderate to vigorous physical activity regularly had a part in risk reduction of premature death in adults (Health.gov, 2016; USDHHS, 2010; Warburton, et. al, 2006). Physical activity is a form of preventive health and also reduces the risk of many common chronic illnesses such as stroke, type II diabetes, coronary heart disease, sleep apnea, some cancers, and respiratory problems (USDHHS, 2010). In regards to mental health, Adams, et al, (2007) found that regular physical activity can improve mood and reduce stress, while Blaber (2005) catalogued improved mood, improved self-esteem, and improved body image as attributes of physical activity. In their assessment of undergraduate students, Tyson, et al, (2010) likewise found that regular participation in physical activity improves mental health.

Regular physical activity can benefit individuals for a lifetime. By being active on a regular basis, individuals can increase bone density, promote strength and balance, and reduce

the effects of osteoporosis for seniors (Brody, 1995; Davidson, 2009). Davidson (2009) further asserts that regular physical activity can reduce the risk of diabetes and improve the immune system for older adults. Weight control is another benefit of regular physical activity. Regular exercise helps the body gain muscle and lose fat (Brody, 1995). Overall, the benefits of physical activity and risk reduction for several chronic illnesses demonstrate that establishing habits of regular physical activity early in life can maintain better health.

Physical Activity Recommendations

The CDC's (2006) current recommendations for physical activity for adults are defined as performing at least 150 minutes of moderate physical activity each week. This level of physical activity should also include muscle strengthening activities two or more days a week that work all major muscle groups including legs, hips, back, abdomen, chest, shoulders, and arms. It is possible for adults to achieve these recommendations through moderate-intensity physical activities such as hunting, cycling, aerobic dance, brisk walking, gardening, swimming, running, and stair climbing.

In order to understand the CDC's (2011) recommendation for physical activity, it is important to define the intensity levels of physical activity. Low, moderate, and vigorous intensity characterize levels of physical activity. Low levels of physical activity involve any type of physical activity that does not cause the heart rate to rise much above resting level. Moderate levels of physical activity are activities that make you breathe somewhat harder than normal. Swimming and bicycling at a regular pace, or playing doubles tennis are examples of this intensity level of physical activity. Whereas, the highest level intensity of physical activity is vigorous activity, which makes the individual breathe much harder than normal. Examples of vigorous activity are aerobics, running, fast bicycling, or fast swimming.

The CDC (2011) includes Leisure Time Physical Activity (LTPA) as an aspect of their recommendations for being physically active during an individual's free time. A study of Asian high school girls in Toronto, used LTPA to refer to participation in physical activity outside the context of school, such as any sport or recreational physical activity (Kerner & Kurrant, 2003). LTPA denotes engaging in moderate LTPA for 30 minutes or more at least five times a week, or participating in vigorous LTPA for 20 minutes or more at least three times per week. However, many people, including university students, do not engage in LTPA, but choose to be sedentary instead. Gal, Santos, and Barros (2005) found that insufficient physical activity is a common practice during leisure time for both males and females.

It is reported that less than half of the adult population participated in consistent physical activity regardless of the strong evidence of its benefits (USDHHS, 2010). This trend affected adolescents as well, with a greater percentage of American students failing to meet recommended standards and neglecting vigorous physical activity (Robbins, et al., 2003). A global look at physical activity indicates that physical inactivity is prevalent worldwide, signaling negative ramifications for health. According to the World Health Organization (WHO) (2008), over 60% of adults worldwide or two-thirds of Europeans do not meet the recommended levels of physical activity. For example, prevalence of inadequate physical activity is alarmingly high in the Eastern Mediterranean Region (WHO, 2008). Research done by Robbins, et al (2003) shows that the percentage of adolescents who meet the recommendation for vigorous physical activity decrease as they get older. In other words, as adolescents age, they are less physically active. Researchers then, need to determine global levels of physical activity in all demographics to identify barriers to engaging in physical activity and plan intervention strategies that promote an active lifestyle.

Concerns for Insufficient Physical Activity in Saudi Arabia

Physical inactivity is described as not meeting any of the following three standards: 30 minutes of moderate-intensity physical activity on five days or more every week, 20 minutes of vigorous-intensity physical activity on three days or more every week, or an equivalent combination achieving 600 metabolic equivalents (MET)-minutes per week. WHO (2008) estimated that physical inactivity causes 3.2 million deaths around the world, making physical inactivity the fourth leading risk factor for mortality globally. Worldwide, 31.1% of adults are physically inactive, while in the United States, physical inactivity rates for males and females are 35.5% and 50.6% respectively. However, in Saudi Arabia, nearly half of the population is inactive. Inactivity rates range between 43% - 99%, depending on the demographic (Al-Hazzaa, 2004). Physical inactivity rates in Saudi Arabia are a result of the changing lifestyles of Saudis and have negatively impacted health in the KSA(KSA). Saudi Arabia, like many countries in the Middle East, has undergone significant economic growth, contributing to sedentary lifestyles and an increase in non-communicable diseases. Changes in work environment, diet, and use of cars contribute to low levels of physical activity (Al-Hazzaa, Abahussain, Al-Sobayel, Qahwaji, & Musaiger, 2011). Chronic illness has become more common in the Saudi population, but despite that fact, there is no physical activity surveillance system in KSA. Previous studies indicate that sedentary behavior and physical inactivity are prevalent. Prevalence rates of inactivity for Saudi children, youth, and adults are 60%, 70%, and 80% respectively (Al-Hazzaa, 2004).

A lack of physical activity can cause many health issues and consequently worsen the quality of life for the individual (Klepfer, 2013). Hlaing, Nath, & Huffman (2007) detailed common chronic illnesses resulting from a lack of physical activity and weight gain, such as depression, cardiovascular disease, some cancers, respiratory illnesses, and type II diabetes, and

asserted that these conditions are preventable with appropriate exercise. Adults aged 18-29 are most likely to establish negative health habits, and attending university typically correlates to weight gain (Hlaing, et al., 2007; Klepfer, 2013). Ultimately, it is vital to determine why university students neglect physical activity in order to prevent chronic illnesses and help them create healthy behaviors.

Hlaing, et al (2007) and USDHHS (2000) state that a major risk factor for chronic illness is physical inactivity. Therefore, modern prevention program designs for chronic illness reduction focus on physical activity. Enhancing physical activity and healthy habits have become a prime intervention strategy and goal (Crespo, Keteyian, Heath, & Sempos 1996; Marcus, et al., 2006). Intervention strategies that target weight gain and obesity, along with chronic illnesses prevention, should focus on perceived barriers to physical activity as a major component. Benefits of consistent physical activity are well-documented; however, many barriers continue to hinder Saudis from being physically active, such as the severe climate, lack of facilities for women, cultural traditions and customs, and lack of time (Amin, Suleman, Ali, Gamal, & Al Wehedy, 2011). Education and knowledge may also play a role in increasing rates of physical activity among Saudi Arabians, particularly females.

Roles of Public and Private Recreation Sectors in Saudi Arabia

Current government initiatives in the KSA are starting to invest significant resources toward leisure satisfaction and recreational facilities for physical activity to be available to the public. While the public sector of Saudi Arabia does provide some facilities in larger metropolitan cities, such as Riyadh, Jeddah, and Dammam, these facilities are not widely available for women and do not help those without access. Likewise, there are not enough sport and recreation for the growth of the Saudi population. Facilities for physical activity include

squash courts, swimming pools, parks for walking or sports, and aerobic studios, but public gyms and recreation centers are limited (Alghenaim, 2013). Therefore, the public and the private sectors are focusing on providing facilities for physical activity to increase leisure time satisfaction and public health. This is a promising investment in the nation's health as a whole.

Both the public and the private sectors should consider obstacles to increasing physical activity. In the public sector, weather, safety, and maintenance of parks and recreational centers hinder individuals from utilizing them. Extreme temperature variations (high temperatures in the summer, low temperature in the winter), are substantial barriers to using the parks for physical activity and sports. Another barrier, safety, is a particular concern for women and children. An exposed space in parks might make women feel unsafe and uncomfortable with bringing their children there, especially without a husband or other male family member to provide protection. Finally, maintenance of parks and recreation centers needs to be frequent, to ensure that these spaces are clean for those who want to use them. Indoor facilities would eliminate weather issues as well as safety concerns, due to larger numbers of people using the facilities.

In regard to the private sector, health and fitness clubs provide sports including, martial arts games, swimming, weightlifting, and other aerobic activities. Most of these health and fitness clubs are located in large cities, as opposed to smaller towns. Fees and accessibility are the most prominent barriers in the private sector in Saudi Arabia. Fees typically range from $70 to $300 per month with average of $180 per month, and further inhibit some people from using health and fitness clubs. Moreover, there are very few facilities for women, who do not have access to the same clubs as men (Samara, Nistrup, Al-Rammah, & Aro, 2015).

For university students in Saudi Arabia, especially females, obstacles to participating in physical activity and using public and private facilities are present. While university students

have the option of joining a private sports clubs, high fees may prevent them from doing so. Likewise, safety and weather in public sector facilities play a big role in deterring students from physical activity. Making safe, accessible indoor facilities could mitigate these obstacles. According to Samara, et al., (2015) for female students in particular, a lack of facilities and little support from the university acted as major barriers to physical activity. Saudi universities could offer support for females through building new facilities for female students to be physically active.

Physical Activity Levels in University Students

Like the general population, university students engage in a substantial amount of sedentary behavior, as opposed to being physically active (USDHHS, 2000, Raynor & Jankowiak, 2010). University demands, along with sedentary activities like sitting in class, studying, or using a computer, contribute to decreasing physical activity rates as students start university (Klepfer, 2013; Sailors, et al., 2010). Kilpatrick, Hebert, and Bartholomew (2005) confirmed that physical inactivity posed a significant health risk for university students. Although several studies indicate that students understand the benefits of a healthy lifestyle, many of them do not engage in physical activity (Lee & Loke, 2005; Samara, et al., 2015). In fact, Irwin (2004), discovered that young adults (ages 18-24) attending university had a rate of insufficient physical activity from a range of 30-60%. Moreover, 30-40% of university students were not successful in meeting physical activity recommendations to achieve health benefits, even though they did engage in some physical activity (Bray & Born, 2004; USDHHS, 2000). According to Yetter (2009) a causal factor of weight gain and obesity was due to regular physical inactivity. Neglecting sufficient physical activity levels can both have negative effects on health and worsen quality of life (Sidman, D'Abundo, & Hritz, 2009).

University students cannot get the health benefits of physical activity if they do not create adequate physical activity patterns. Raynor & Jankowiak (2010) conducted a study to determine university students' physical activity behaviors, using the number of their daily steps to see if they met physical activity recommendations. They found that 78% of university students did not receive the complete health benefits, because they failed to participate in sustained, or a minimum of 10 minutes, episodes of moderate to vigorous physical activity on most days of the week.

A separate study on university students' physical activity levels conducted by Abdullah, Wong, Yam, and Fielding (2005) was designed to understand the prevalence and predictors of physical inactivity for students in a Hong Kong university, with 1189 male and 1849 female students participating. A questionnaire was used to determine the level of physical activity. The researchers specified that there is not enough data on physical activity levels in Hong Kong currently, but used existing data that indicate low physical activity levels (31%) among young people. Physical inactivity tends to increase with age in the student population; therefore, physical activity levels are predicted to decrease among university students and become lower than physical activity levels among grade school students.

Research on university students in New Delhi, India conversely showed that many students were engaging in adequate rates of physical activity. Khera and Sharma (2012) surveyed 297 students, hostellers noted as a point of significance, to determine physical activity levels, using the Global Physical Activity Questionnaire (GPAQ). The three areas of physical activity they covered were work, transport, and recreation. A total of 173 (58.2%) students had high physical activity levels, 83 (27.9%) had moderate physical activity levels, and 41 (13.8%) had low physical activity levels. Participants in this study reported lower levels of physical activity

than day students. This particular study is atypical in that students in this region were more active than in others, perhaps due to the participant sample. Khera and Sharma (2012) point to hostellers' lack of recreational facilities and means of transportation as the major difference in activity rates.

The issue of low levels of physical activity among university students is prevalent in the Arabian Gulf. For example, Al-Isa, Campbell, Desapriya, & Wijesinghe (2011) found that physical activity levels among Kuwaiti university students were at 45%, while the most recent data shows that 30% of university students in Kuwait are overweight and 19.8% are obese (Kabir, Zafar, & Waslien, 2013). Likewise, Awadalla, et al., (2014) found that Saudi students attending King Khalid University had a physical inactivity rate of 58%.

A multi-regional comparison of university students indicates that physical activity intervention is needed, because engaging regularly in adequate levels of exercise can help an individual maintain a healthy quality of life. Further research needs to be done to assess physical activity levels among female Saudi university students.

Females and Insufficient Physical Activity

Males are typically more physically active than females worldwide. In addition to that, women in particular become less physically active with age (Sherwood & Jeffery, 2000). McArthur and Raedeke (2009) reaffirmed the gender gap in physical activity, with females in their study reporting less time engaging in physical activity than males. Similarly, Munford's (2011) study discovered a strong correlation between gender and physical activity levels, with males being more physically active and reporting less barriers.

In most studies reviewed, males reported greater participation in two levels of physical activity, moderate and vigorous intensity, than females, whereas, females reported greater

participation in walking as physical activity than males. In the Eastern Mediterranean Region, the prevalence rates of insufficient physical activity in women were almost 50%, while the prevalence for men was 36% (WHO, 2008). Gomez-Lopez, Gallegos, and Extremera (2010) examined physical activity and the relation to gender in Spanish university students and found that women were twice as likely to quit engaging in physical activity and subsequently more likely to engage in a more sedentary lifestyle. Gal, et al. (2005) conducted a study of Portuguese adults that revealed, after noting daily energy expenditure and physical activities, women were more sedentary than men, with 74% of men being sedentary and 86% of women being sedentary.

Gender discrepancies in university students' participation in physical activity has not been extensively studied, particularly among female Saudi students. The current literature suggests that reasons for engaging in physical activity does vary by gender, with women participating less in general. A study conducted by Awadalla, et al. (2014) catalogued Saudi students' patterns of physical activity at King Khalid University, using a sample size of 831 female and 426 male students. They found that 58% of the students were physically inactive. Males reported higher rates of vigorous-intensity physical activities than females, whereas females reported higher rates of walking than males. In order to achieve the full health benefits of being physically active, Saudi female students would benefit from engaging in more moderate to vigorous intensity forms of physical activity, such as jogging, bicycling, or swimming.

High inactivity rates indicate that it is important to focus on why females choose to take part in or neglect physical activity. Common reasons for participating in physical activity for women indicate that women are aware of the benefits of physical activity, and are cited in two studies in particular. The first study, designed by Weinfeldt and Visek (2009), looked at a total of 450 students who enrolled in fitness courses. They found that the most common reasons for

enrolling in fitness courses were similar for both genders. Women claimed improving fitness (89%), exercising frequently (86%), and enjoyment (82%) as their top reasons for taking fitness classes, whereas men claimed enjoyment (85%), frequent exercise (81%) and improving fitness (80%) respectively as major reasons. Men preferred to improve their strength (75%), while women wanted to stay active (84%). The study also indicated that females perceive different benefits when choosing to engage in physical activity than males. Weinfeldt, et al., (2009) neglected to study perceived barriers, which is a major component in gender differences and physical activity participation.

The study conducted by Tergerson and King (2002) examined these gendered differences using a sample of American high school students (290 females and 245 males). Female students cited the health benefits of being physically active as staying in shape, having more energy, and losing weight, while male students cited the health benefits as getting stronger, being competitive, and staying in shape. Both studies demonstrate that gender is an important variable and even predictor for participation in physical activity. Research on physical activity among female university students must continue in order to promote health benefits for this demographic, particularly in Saudi Arabia.

To the researcher's understanding, only one study has been done to assess Saudi female university students' knowledge of the benefits of physical activity. Samara, et al. (2015), studied 94 first-year students to determine their knowledge of the benefits of physical activity. These women did show knowledge of the benefits, but they come from the capital city Riyadh, making the participants less representative of the country of Saudi Arabia as a whole. This does not provide a diverse sample of female Saudi students, whereas this thesis will use a larger sample size of female Saudi students from several different parts of Saudi Arabia. In addition to little

information on perceived benefits of physical activity among Saudi female university students, more research is needed to increase awareness of health benefits of being physically active.

Theoretical Framework

Interventions for physical inactivity are becoming more essential among industrialized nations, which tend to have higher rates of inactivity (Spence & Lee, 2003). In order to plan interventions, a theoretical framework must be utilized. Theoretical frameworks enable researchers to identify and understand factors that influence physical activity behaviors, and further find facilitators of specific behaviors. Historical psychological research on health and interventions aimed at changing health behaviors have focused on common variables such as nutrition, substance abuse, and demographics, thus catalyzing the development of new theories (Munford, 2011). The Health Belief Model has been chosen as the theoretical framework for this study, to determine the effect that benefits and barriers have on physical activity behaviors and knowledge in Saudi female university students attending school in both the U.S. and Saudi Arabia.

Health Belief Model (HBM)

This study will utilize the Health Belief Model (HBM) as the primary theoretical framework for research. The HBM was originally developed in the 1950s by members of the U.S. Public Health Service to determine why the public neglected to participate in detection and prevention programs (Katalanos, 2004). In its essence, the HBM is aimed towards predicting and understanding if an individual is likely to participate in health-related behaviors and has been restructured to find behavioral determinants that prevent or protect against disease. It is commonly used to determine likelihood of behavioral change in groups.

In their research on early use of the HBM, Janz and Becker (1984) found four key

variables that signaled behavioral change: barriers, susceptibility, benefits, and severity respectively. However, early studies before the 2000s such as Janz and Becker's were not consistently reliable, and the HBM underwent modification to include cues to action, self-efficacy, knowledge, and sociodemographic variables in order to strengthen the quality of predictions the HBM yields.

Cues to action involve triggers or catalysts for a change in health-related behavior, meaning an individual may not change their behavior until an event forces them to do so (Burak & Meyer, 1997). These cues could be an internal event, such as a diagnosis of an illness, or an external event, such as receiving information on chronic illness. Self-efficacy denotes whether or not the individual believes they can change their behavior successfully (Bandura, 1977). Knowledge greatly affects behavior, as well as community awareness, and can be used as a variable to plan interventions. Lastly, sociodemographic variables are similar to knowledge in that they can act as predictors to behavioral patterns.

Limitations are present in the HBM. As the HBM has been expanded, the multitude of variables have each introduced operational issues, making the HBM less uniform as a whole (Sheeran & Abraham, 1996). Multiple scales and means of scoring have been cited as weaknesses as well, and many researchers have coped by creating their own scales, making standardization difficult. Certain variables are likewise complex and can be abstract, again making them difficult to quantify.

The HBM was chosen for this study due to its compatibility with the Exercise Benefits / Barriers Scale (EBBS). This model is especially adept for predicting behavior modification, and an especially useful framework when used in conjunction with the EBBS instrument, which catalogues benefits and barriers to predict positive health behaviors.

Utilizing the Exercise Benefits / Barriers Scale (EBBS)

The Exercise Benefits / Barriers Scale (EBBS) was the chosen instrumentation for this study due to its success at predicting health behaviors. The EBBS is a useful tool for comparing perceived benefits and perceived barriers, and subsequently determining the correlation between those two factors in order to make a conjecture on whether or not the individual will engage in a certain health behavior. There are 43 items on the survey in total, with 14 items related to barriers and 29 items related to benefits. Barriers include five categories: exercise milieu, time expenditure, physical exertion, family encouragement, and facility obstacles. Benefits fall under five categories as well: life enhancement, physical performance, psychological outlook, social interaction, and preventive health.

Many studies utilize the EBBS to determine physical activity levels in certain subsets of the population. One such study was conducted by Darawad, et al. (2016), who published more in-depth research concerning exercise patterns in Jordanians with Diabetes Mellitus. They further investigated how that related to this demographics' physical characteristics, perceptions of benefits and barriers, and exercise planning. Participants were Jordanian adults with Diabetes, with 115 returning their questionnaires for the survey. The survey contained five parts, including the Exercise Benefits / Barriers Scale (EBBS). Results showed that participants did not exercise frequently (2.9 hours a week), and walking was the most common exercise. BMI, comorbidity index, and exercise self-efficacy were related to how often and how long participants exercised. Lack of time and desire were the main barriers to exercise for this group.

Another study conducted in Jordan by Darawad, Khalil, Hamdan-Mansour, and Nofal (2014) focused on Jordanians with chronic illnesses to determine if they experienced trouble exercising in the form of self-efficacy, perceived benefits and barriers, and exercise planning.

They further looked at how those variables interacted to design alternative plans for helping this demographic exercise regularly. The participants were 402 adult outpatients with chronic illnesses, from hospitals in the teaching, private, and government sectors. The researchers used questions gathering demographic data, the Charlson Comorbidity Index (CCI), the Exercise Benefits / Barriers Scale (EBBS), the Exercise Self-Efficacy Scale (ESE), and the Commitment to a Plan for Exercise Scale. The results showed that patients had a moderate level of perceived self-efficacy, with a mean score of 47.5. Half of the patients scored in the middle (40 and 54.4), meaning they had a moderate level of perceived efficacy to practice physical activity. The plan to exercise scores showed that participants had high levels of intention to exercise, with a mean score of 2.0 out of a range from 1.1-2.8. Furthermore, participants had a nearly equal perception of benefits and barriers for engaging in exercise, with a mean score for barriers being 2.4 and a mean score for benefits being 2.3. Despite high intention to exercise and cognition of the benefits, participants still tended to be overweight and inactive.

Shin, Hur, Pender, Jang, and Kim (2006) chose the EBBS instrument to measure perceived self-efficacy, barriers, benefits, and a commitment to a plan for exercise among older Korean women diagnosed with osteoarthritis and osteoporosis. They had 154 participants, and used a modified EBBS instrument to remove redundancies in the survey. To clarify, they combined items “I will prevent heart attacks by exercising” and “Exercising will keep me from having high blood pressure” into “Exercising improves functioning of my cardiovascular system”. They also removed “My spouse does not encourage exercising” which was similar to “My family members do not encourage me to exercise”. They found that exercise self-efficacy was the most influential factor in commitment to a plan for exercise.

The EBBS has been especially effective in studies assessing university students’ physical

activity levels, perceived benefits, and perceived barriers. Grubbs and Carter (2002) used the EBBS instrument to determine undergraduate students' physical activity behaviors, perceived benefits, and perceived barriers. They used a sample of 147 American university students, and found that their perceived benefits and barriers had a substantial impact on their physical activity behaviors. Benefits that signaled increased physical activity levels were about physical performance and appearance, while barriers that signaled lower levels of exercise were physical exertion and lack of time.

Brown (2005), also utilizing the EBBS, surveyed 398 American undergraduates' physical activity levels to examine the correlation to perceived benefits and barriers. Analyzing the results for benefits showed an average score of 63.22 on a scale of 0-87, meaning that participants perceived a large number of benefits. Barriers, on the other hand, averaged a score of 12.63 on a scale from 0-42, making barrier perception less common than benefit perception. There was not a significant difference in perceived benefits along gender lines, and benefits and barriers were negatively correlated. Physical activity increased with more perceived benefits, as in Grubbs' and Carter's (2002) research.

Understanding predictors of high or low physical activity levels in female university students has significance in this study, which seeks to understand barriers and benefits knowledge among female Saudi students. More recent research conducted by Lovell, Ansari, and Parker (2010) similarly looked at benefits and barriers using the EBBS for 200 female subjects. The participants were pulled from two universities in the United Kingdom, and all self-identified as non-exercising. Despite neglecting physical activity, the participants did report many more perceived benefits than perceived barriers to exercise. Respectively, the greatest benefits they reported were physical performance, psychological outlook, preventive health, life enhancement,

and finally social interaction. The greatest perceived barriers, respectively, were physical exertion, time expenditure, exercise milieu, and no familial support and discouragement.

Lastly, the most closely-related research to the research conducted in this thesis examines Saudi Arabian females' physical inactivity among 94 first-year, female students at Princess Nora Bint Abdul Rahman University in Riyadh, KSA. The EBBS was distributed to participants, along with questionnaires on demographic information, social factors, the Arab Teens Lifestyle Survey, and the Barriers Self-Efficacy Scale (BARSE). The goal was to discover the relationship between these participants' knowledge of the benefits and barriers of physical activity and that relationship's impact on physical activity participation. The researchers found that these participants did have knowledge of the benefits of physical activity. Moreover, they perceived the benefits of physical activity to be important, but they were still mostly physically inactive. The social factor that created a barrier to physical activity was attending the university, which they felt did not offer adequate support or facilities for physical activity. The greatest barrier among this group was not having a facility to go to, as opposed to family or society (Samara, et al., 2015).

Barriers to Physical Activity

Perceived barriers are hindrances that can keep individuals from beginning or maintaining a desired behavior change (Allison, et al., 1999). Sherwood, et al., (2000) conducted an in-depth literature review in order to determine what behavioral characteristics facilitated regular participation in physical activity. Subsequently, they have created two broad categories, individual and environmental characteristics, that could be factors in why adults choose or neglect to participate in physical activity. Motivation, exercise history, self-efficacy, skills, and other health behaviors, make up individual barriers, while environmental barriers include

accessibility, cost, social support, and time barriers. Allison, et al (1999) instead classified barriers by two categories, internal and external. Internal barriers stem from individual, psychologically-based factors. Examples include other interests, a lack of motivation, or apprehension about publically participating in physical activity. Environmental barriers reflect external factors, including safety concerns, lack of transportation, weather conditions, lack of time, and family discouragement.

Understanding barriers to physical activity is a key aspect of preventing noncommunicable diseases and promoting fitness (Al-Otaibi, 2013). Knowing the rationale behind inactivity or low levels of physical activity is necessary for curbing the high prevalence of chronic illnesses. Declining rates of physical activity could be due in part to the high number of barriers that make it difficult to engage in physical activity. Moreover, it is essential to study barriers to physical activity holistically and expand the knowledge of these obstacles, especially among Saudi females. Without adequate knowledge and perception on the subject of physical activity, healthy behavioral changes are unlikely to occur.

Globally, many researchers have studied barriers toward physical activity. Time expenditure has often been cited as the greatest barrier to physical activity (Allison, Dwyer, Goldenberg, Fein, Yoshida, & Boutillier, 2005; Andajani-Sutjahjo, Ball, Warren, Inglis, & Crawford, 2004; Daskapan, et al., 2006). However, other researchers have found that fatigue was the most important barrier to physical activity (Daskapan et al., 2006; Phillips, Flemming, & Tsintzas, 2009). Menon (2008) asserted that lack of will power (98.5%) was the most commonly reported barrier to physical activity. Furthermore, other significant difficulties reported by participants were time expenditure (94%), fatigue (91%), and family encouragement (86%).

The Canadian Fitness and Lifestyle Research Institute [CFLRI] (1996) examined the

causes for young adults to engage in physical inactivity. Major, moderate, and minor reasons were the three categories for not participating in physical activity. Major reasons for physical inactivity among the participants were lack of time, lack of energy, and lack of motivation. Moderate barriers to physical activity were excessive cost, illness or injury, feeling uncomfortable, lack of skill, and fear of injury. Lastly, minor barriers to physical activity included lack of safe places, lack of childcare, lack of a partner, insufficient programs, lack of support, and lack of transportation. In Australia, Cerin et al. (2010) surveyed a sample of 2,194 adults and found that lack of time and lack of motivation were the most commonly cited barriers associated with weekly amounts of leisure time physical activity.

Three types of barriers are prominent among the Arab population: individual, cultural, and environmental barriers. Barriers to physical activity among Arabic adults were studied in Benjamin and Donnelly's (2013) comprehensive literature review, which involved 15 studies conducted and published between 2002-2013. Lack of time and pain while exercising were major barriers on the individual level. The organizational and institutional barriers, on the other hand, strongly impacted women, especially in Saudi Arabia, in that they did not have the same family support as the men and preferred to dress modestly. Another example of a barrier to physical activity on the organizational level was the use of housemaids as opposed to women using housework as a physical activity. Finally, on an environmental level, the two most frequently cited barriers were "weather" and "lack of exercise facilities".

Furthermore, in the Middle East much research has been conducted on different populations to identify the prevalence of specific barriers to participation in physical activity. Al-Otaibi (2013) examined the association between the stages of change for physical activity and perceived barriers in a sample of Saudi adults in Al-Ahsa. Women and men had different

perceived barriers; Women cited more external barriers, primarily “lack of time”. Likewise, Amin, et al, (2011) studied perceived barriers among Saudi adults and 65.9% of the participants stated that weather was the main barrier to physical activity. Weather was followed by traditions and customs, which were cited by 60% of the participants, particularly females. Lack of adequate places for exercising was mentioned by 55.4% of the subjects. Lack of time due to work, particularly long office hours, work overload, extra jobs among men and housework among women, were mentioned by 44.7% of the participants.

Depending on the geographic region, weather can be either a very significant or very insignificant barrier to physical activity. In Canada, for example, the Canadian Fitness and Lifestyle Research Institute (1996) found that weather did not have a noticeable relationship with physical activity. Similarly, Humpel, Owen, and Leslie (2002) explored the relationship between physical environmental factors such as accessibility of facilities, opportunities for activity, weather, safety and aesthetic conditions to physical activity, and discovered that weather showed a weaker relationship with physical activity. In contrast to areas with more temperate climates, one of the common barriers that many people face in the Eastern Mediterranean Region is weather. In Arab’s (2007) research, the majority of the participants claimed that the hot weather in Kuwait was considered a deterrent to regular physical activity. In a similar case, Saudi Arabia is comprised mostly of desert, and the summers (April to October) are extremely hot and dry with temperatures reaching above 124°F. The hot weather of Saudi Arabia makes it difficult for Saudis to participate in outdoor physical activities such as walking, bicycling, or sports.

University Students and Barriers to Physical Activity

In academia, much research has been done to determine the specific barriers associated with university students’ participation in physical activity (Allison, et al., 1999; Daskapan et al.,

2006; El-Gilany, Badawi, El-Khawaga & Awadalla, 2011; El- Gilany, & El- Masry, 2011). For instance, Mudronja, Petračić, & Pedišić (2011) researched barriers to physical activity among 134 students at Zagreb University in Croatia. They identified 15 barriers to physical activity using the Barriers to Physical Activity Questionnaire (BPAQ) and found that laziness was the most frequently cited barrier. Conversely, exhaustion caused by exercise was the least frequently cited barrier. University students also tended to cite school obligations as a barrier, as well as not having enough time to engage in physical activity.

In Hong Kong, Abdullah et al. (2005) examined barriers to physical activity among university students through asking them whether or not they participated in physical activity recently. If the student reported that they were inactive, they were instructed to specify barriers using a given set of five barriers: "no time, no partner, tired/sickness, no interest, other (specify)." The most common barrier among physically inactive students was "no interest". In addition to "no interest", students mentioned lack of time as one of their biggest barriers. Being female and having a poor health status were the largest predictors of physical inactivity.

Daskapan, et al. (2006) examined the exercise habits and perceived barriers to physical activity among Turkish university students. The results revealed that lack of time due to a busy lesson schedule, and lack of time due to responsibilities related to the family and social environment were the most commonly cited barriers. In a similar case, El-Gilany and El-Masry (2011) conducted a study among a sample of 319 Egyptian (173 males, 146 females) and 297 Saudi (230 males, 76 females) medical students to examine perceived barriers to physical activity. Both groups reported time limitation due to busy study schedules as the most frequently perceived barrier for not participating in physical activity, followed by non-interest in sports, lack of accessible and suitable sporting places, and lack of support or encouragement from

others. These studies share several commonalities, particularly students' tendencies to cite lack of time as a significant barrier to physical activity.

Perceived Barriers and Female University Students

Males and females consistently perceive differing obstacles to participating in physical activity. This gender divide is apparent in most cultures. For example, in a study conducted by Abdullah, et al. (2005) at a university in Hong Kong, the female participants were more likely to consider "no interest" the reason for their physical inactivity, whereas the male participants were more likely to attribute physical inactivity to "no partner". Similarly, Romaguera, et al. (2011) found that females cited beginning university studies and a lack of time as barriers, and they claimed to engage in physical activity for pleasure and fitness. Men, on the other hand, participated in physical activity for pleasure and to socialize.

In his examination of 412 male and female university students, Munford (2011) found the barriers that men and women perceive are considerably different. Three barriers in particular were prevalent: "exercise tires me", "I am fatigued by exercise", and "exercise is hard work for me". Munford (2011) further recommends examining barriers to physical activity, which is helpful in revealing factors of physical activity among university students.

Mudronja, et al. (2011) found that among Croatian males and females there are few differences in common barriers to physical activity. Laziness, interference with school, lack of time, being busy, and not enough facilities for physical activity were common barriers for both males and females. However, two barriers were unique to males in particular; men were more concerned with being hindered by their health issues or family. Similarly, Tergerson et al. (2002) surveyed males and females to examine how each gender perceived barriers to physical activity. Their study revealed three major reasons for inactivity in females: lack of time, tiredness, and

wanting to do other activities as opposed to physical activity. Male participants' greatest barrier was the belief that physical activity was unimportant. Arabic women faced distinct perceived barriers according to Qahoush, Stotts, Alawneh, and Froelicher (2010), who studied a sample of 180 Arabic women in the United States. The most frequently cited barrier was a lack of time, followed by stress, taking time away from family, pain when exercising, exercise is boring, a lack of money, and a lack of support from family and friends respectively.

In the Middle East, female university students are confronted with unique barriers to physical activity. Harkness's (2012) research examined sport participation among females in the country of Qatar. Participants were three coaches, 25 female basketball players, and two former athletes from the Education City campuses. The sample was ethnically diverse and mostly Muslim. Data was gathered through observing games and practices. During observation, Harkness found four significant barriers among female athletes: hijab, gender segregation, family, and reputation. Unlike females who were strict Muslims, the participants in this study were not strict about wearing their hijab and practiced sports. Gender segregation likewise greatly affected the female athletes, and men were not allowed at games or practices. Participants' families were atypical in that they supported sport participation, whereas typical families discouraged sport participation and decided whether or not the females in their family could engage in sports. Lastly, reputation acted as an obstacle in that most women did not want to engage in activities that were reserved for males, like sports.

A separate study that focused on gendered barriers to physical activity among a segment of the Middle Eastern population, Saudis in particular, was conducted by Al-Otaibi (2013). Al-Otaibi (2013) surveyed 242 Saudi adults in Al-Ahsa to determine the difference in perceived barriers and BMI between male and female participants. Time expenditure was the largest barrier

to physical activity according to the female participants. Males reported more internal barriers than females and motivation was their most frequently cited barrier to physical activity. There is little information about Saudi female university students' barriers to physical activity, and determining this subset's perceived barriers could change health behaviors and benefits for the KSA's health overall.

Barriers and Saudi Arabian Female University Students

It is essential to study health beliefs and behaviors in order to promote physical activity habits among Saudi females attending universities. To discover why Saudi Arabian females were physically inactive, Samara, et al., (2015) conducted a study to determine this demographics' self-efficacy, perceived barriers, and perceived benefits of physical activity. The participants were 94 female students in Riyadh, and they were given a five-part questionnaire. The questionnaire contained sections on socioeconomic status, the Arab Teens Lifestyle (ATLS) survey, the Barriers Self-Efficacy Scale (BARSE), social factors, and the Exercise Benefits / Barriers Scale (EBBS). They found that while these students had perceived the benefits of physical activity to be worthwhile, they were still mostly sedentary. They had low self-efficacy for physical activity, and the social factor that was a barrier to physical activity was going to the university. Furthermore, the largest barrier to physical activity was not having a facility to go to, as opposed to family or society.

Literature examining barriers to physical activity among gender lines in university students could give insight into common themes for physical activity participation in students. However, to our knowledge, Samara et al (2015) is the only study that examines benefits and barriers to exercise among female Saudi university students. This research needs to be expanded upon before adequate physical activity promotion can take place. A more diverse range of female

Saudi students need to be explored to accurately assess barriers and benefits to exercise as perceived by this population. Therefore, the purpose of this descriptive study focuses on two main research questions. The first research question is assessing the perceived benefits of physical activity. The second research question is determining the most common barriers to physical activity among female Saudi Arabian university students in the KSA, the United States, and Saudi Arabia.

CHAPTER III:
METHODS

Introduction

This research study built on previous research and methodologies to discover more information about perceived barriers and benefits to physical activity among female Saudi university students in the KSA and the United States. This chapter discussed the participants and the various instrumentations, particularly the Exercise Benefits/ Barriers scale (EBBS), the procedures, and the statistical analysis.

Participants

The participants consisted of only female Saudi university students aged 18 or older. The study excluded non-Saudi, non-female, and non-university students because this study sought to understand Saudi female university students' benefits of and barriers to participation in physical activity. Participants attended Middle Tennessee State University (MTSU) or the University of Hafr Al batin (UHA) in the KSA. UHA was established in 2014. The university is located in Hafr Al batin city in the eastern region of the KSA, with approximately 13,000 students currently in attendance. UHA has ten colleges such as the College of Computer Science and Engineering, the College of Education, the College of Arts and Sciences, and the College of Business Administration. Participants study on the all-female campus. A total of 211 participants were surveyed, who were enrolled in various academic majors. Confidentiality was guaranteed for the participants, and there was not any identifiable information collected from all participants. This study was anonymous; participants' names were not included on the survey, and their responses were not shared. Participation was voluntary, and only completed surveys were included in the study. Financial or academic compensation was not provided in order to participate. The protocol for this study has been approved by the Middle Tennessee State University Institutional Review

Board (See Appendix A). Approval was also obtained from the Dean of Hafr Al batin University.

Instrumentation

Participants completed a survey comprised of two sections measuring different dimensions. First, the demographic variable data (i.e. age, marital status, memberships to sports clubs, etc.) was gathered. Second, benefits of exercise was measured to assess the students' perceptions, and the Barriers to exercise was used to determine which perceived barriers were cited most frequently by Saudi female university students using the Exercise Benefits/ Barriers scale (EBBS) which is available in English in Appendix B. The Arabic version of the instrument is available in (Appendix C). The following sections have further explained instrumentation in depth.

Exercise Benefits / Barrier Scale (EBBS).

This study utilized the Exercise Benefits / Barrier Scale (EBBS). The EBBS collected data on the participants' perceptions of exercise. It was originally created by Sechrist, Walker, and Pender (1987) as a means to understand how people perceive engaging in exercise. The questionnaire contained 43 questions divided into two sections, a benefits section that has 29 items, and a barriers section that has 14 items. The instrument used a Likert scale from 1 (strongly disagree) to 4 (strongly agree) with no neutral option, and Barrier items (4, 6, 9, 12, 14, 16, 19, 21, 24, 28, 33, 37, 40, 42) were reverse-scored. Sechrist et al. (1987) defined ten factors in the EBBS. The benefits factors were life enhancement, physical performance, psychological outlook, social interaction, and preventive health. The barriers factors were exercise milieu, time expenditure, physical exertion, family encouragement, and facility obstacles. The item numbers for the benefits factors and the barriers factors are presented in Table 1

Table 1

Item Numbers for Benefits Factors and Barriers Factors

Benefits Factors	**Item Numbers**
Life Enhancement (Psycho-Social)	8, 10, 13, 20, 26, 27, 29, 32, 35, 36, 38, 39
Physical Performance	7, 15, 17, 18, 22, 23
Psychological Outlook	1, 2, 3
Social Interaction	11, 25, 30, 34
Preventive Health (Body Characteristics)	5, 31, 41, 43

Barriers Factors	**Item Numbers**
Exercise Milieu	12, 14, 28
Time Expenditure	4, 24, 37
Physical Exertion	6, 19, 40
Family Encouragement	21, 33
Facility Obstacles	9, 16, 42

The validity and reliability of the EBBS has been found to be consistent. Sechrist, et al. (1987) developed the EBBS scale to better understand how people perceived participating in exercise. Using 650 participants, the EBBS had an overall Cronbach's alpha of .954 (full scale 43 questions). The benefits section had a Cronbach's alpha of .954 and the barriers section had a

Cronbach's alpha of .866. Moreover, test-retest reliability had a score of .89 for the entire instrument, .89 for the benefits scale, and .77 for the barriers scale.

For the current study, the Arabic EBBS was obtained from the previous research of Darawad, et al. (2016). In their study, the EBBS English version was translated into Arabic using the standard translation. Darawad, et al. (2016) conducted a pilot study to overcome the issues with backward translation to ensure clarity and that participants could understand the study. Previous approval was obtained from Darawad et al. (2016) to use their Arabic Version of the EBBS.

Scores range from 43 to 172 for the complete EBBS. A higher score correlates to a positive perception of exercise. The Barriers Scale is reverse-scored, unless used alone without the Benefits Scale. If used separately, the Benefits Scale score ranges from 29 to 116, while the Barriers Scale score ranges from 14 to 56. A higher score on the Barriers Scale correlates to a higher perception of barriers to exercise. Missing data can be handled in two different ways. If more than five percent of the items are unanswered, it is recommended that the response be discarded. If the missing item response rate is less than five percent, median substitution prevents falsely low scores.

Procedure

First, the approval of Institutional Review Board at Middle Tennessee State University (MTSU) and the University of Hafr Al batin (UHA) in the KSAwere obtained prior to data collection to ensure the protection of human subjects. The procedure for each group has been explained in detail in the following two sections.

Female Saudi students at MTSU.

The Exercise Benefits / Barriers Scale (EBBS) was presented to the participants as a single document written in Arabic. Students responded to the EBBS to assess their perceived benefits of exercise as well as their perceived barriers to exercise. The questionnaire was administered during summer semester. The survey was done during the meeting of the Organization of Saudi students in the city of Murfreesboro, TN, where the researcher was coordinating with the organization management on a particular day and time specified to conduct the questionnaire. After receiving approval for data collection, the researcher introduced herself to the students and informed them about the purpose of the study and about guarantees of anonymity and confidentiality. The information was collected by the researcher. Approximate time to complete the survey was 20 to 30 minutes. Participation was entirely voluntary. After the conclusion of the study, the researcher debriefed the participants about the details of the study and answered any questions participants had.

Female Saudi students at UHA.

The Exercise Benefits / Barriers Scale (EBBS) was presented to the participants as a single document written in Arabic. Students responded to the EBBS to assess the students' perceived benefits of exercise as well as their perceived barriers to exercise. The questionnaire was administered during the month of June. It was conducted away from the period of exams since that could have negatively influenced the participants' emotional state and skew our findings. The survey was done during the usual class time, with previous approval given from the corresponding professor. After receiving approval for data collection, the researcher introduced herself to the students in each classroom and informed them about the purpose of the study and about guarantees of anonymity and confidentiality. The information was collected by

the researcher in the presence of each classroom's professor. Approximate time to complete the survey was 20 to 30 minutes. Participation was entirely voluntary. After the conclusion of the study, the researcher debriefed the participants about the details of the study and answered any questions participants had.

Variables

The scores for the responses to each item were imported into the data editor of IBM SPSS version 20.0. The variables operationalized from these scores are defined in Table 2.

Table 2

Sources, Functional and Operational Definitions, and Measurement Levels of Variables

Variable	Source [a]	Operational Definition	Measurement Level
School attendance	DCQ	1 = KSA 2 = USA	Nominal
Exercise Benefits	EBBS	Scores for Items 1, 2, 3, 5, 7, 8, 10, 11, 13, 15, 17, 18, 20, 22, 23, 25, 26, 27, 29, 30, 31, 32, 34, 35, 36, 38, 39, 41 and 43. Scored from 1 to 4, where 1 = strongly agree; 4 = strongly disagree. Scores may be composited if internal consistency reliability is good.	Interval Scale
Exercise Barriers	EBBS	Scores for Items 4, 6, 9, 12, 14, 16, 19, 21, 24, 28, 33, 37, 40 and 42. Scored from 1 to 4, where 1 = strongly agree; 4 = strongly disagree. Scores may be composited if internal consistency reliability is good.	Interval Scale
Sports Club Membership	DCQ	1 = Member of Sports Club 2 = Not member of Sports Club	Nominal
PE/Health Education	DCQ	1 = Studied PE/Health Education 2 = Not studied PE/Health Education	Nominal
Attended PE/Health Workshop	DCQ	1 = Attended PE/Health workshop 2 = Not Attended PE/Health workshop	Nominal
Number of days of exercise per week	DCQ		Nominal

Table 2 Cont.

Variable	Source [a]	Operational Definition	Measurement Level
Duration of exercise per week	DCQ		Nominal
Type of Activity	DCQ	1 = Walking 2 = Running 3 = Physical Fitness 4 = Ball sports 5 = others	Nominal

Note: [a] DCQ = Demographic Characteristics Questionnaire (see Appendix A); EBBS = Exercise Benefits/ Barriers Scale (see Appendix B).

Statistical Analysis

Statistical analysis was conducted with SPSS version 20.0 using the protocols described by Field (2009). Frequency distributions (counts and percentages) were used to summarize the categories of the demographic characteristics of the participants. Descriptive statistics (means and standard deviations) were used to summarize the Exercise Benefits and Exercise Barriers scales, calculated separately for female students in the USA "MTSU" and in KSA "UHA" The normality of the variables was checked using the Kolmogorov-Smirnov test.

The factorial structure of the Exercise Benefits and Exercise Barriers scales was checked using Principal Components Factor Analysis with Varimax rotation and Kaiser normalization. The factors extracted from the scores for the 43 items were compared with those defined by Sechrist et al. (1987) in Table 1. The variables and tests which were used to address the nine research questions are outlined in Table 3. The level of statistical significance was set at $\alpha = .05$.

For the purpose of analysis, the participants were categorized into two groups (female students in the USA at "MTSU", and female students in KSA at "UHA". Possible scores for the Exercise Benefits and Barriers scales ranged from 1 to 4; with 4 representing the highest perception of benefit and perception of barrier. T-tests were used to compare the two groups on

mean scores for benefits and barriers. A Chi Square analysis was used to analyze the relationship between sports club membership and whether the females were attending university in the USA or KSA, as well as the relationship between enrolling in physical education classes and whether the females were attending university in the USA or KSA. PLS path analysis was used to determine whether country of attendance and enrolling in a physical education class were related to a lack of facilities as a barrier to physical activity, and also to determine whether country of university attendance and perceived barriers could predict the mean score of benefit perception of physical activity. Partial least squares path analysis was used, because, unlike regression analysis, it does not have so many theoretical assumptions, and it is not sensitive to the distributional and measurement characteristics of the variables (Hair et al., 2014). PLS path analysis is not supported by SPSS, therefore SmartPLS software, applying the methods described by Wong (2013).

Table 3

Variables and Statistical Tests Used to Address the Research Questions

Research Question	DV	IV	Analysis
RQ1. Is there a difference between KSA and USA regarding the strength of their Exercise Benefits to physical activity?	Exercise Benefits	School Attendance	Reliability analysis t-test
RQ2. Is there a difference between KSA and USA regarding the strength of their Exercise Barriers to physical activity?	Exercise Barriers	School Attendance	Reliability analysis t-test

Table 3 Cont.

Research Question	DV	IV	Analysis
RQ3. Is there an association between School Attendance and membership in a sports club?	Sports Club Membership	School Attendance	Chi-Square test
RQ4. Is there an association between School Attendance and studying PE /health education?	PE/Health Education Class	School Attendance	Chi-Square Test
RQ5. Is there an association between School Attendance and Attending PE /health workshop?	PE/Health workshop	School Attendance	Chi-Square Test
RQ6. Is there a difference between KSA and USA regarding their number of days of exercise?	Number of days of Exercise	School Attendance	Reliability analysis t-test
RQ7. Is there a difference between KSA and USA regarding their duration of exercise?	Duration of Exercise	School Attendance	Reliability analysis t-test
RQ8. Do School Attendance and strength of Exercise Benefits and Exercise Barriers to physical activities predict an individual's number of days of exercise?	Number of days of Exercise	School Attendance Exercise Benefits Exercise Barriers	Partial Least Squares Path Analysis (PLS)

Table 3 Cont.

Research Question	DV	IV	Analysis
RQ9. Do School Attendance and strength of Exercise Benefits and Exercise Barriers to physical activities predict an individual's duration of exercise?	Duration of Exercise	School Attendance Exercise Benefits Exercise Barriers	Partial Least Squares Path Analysis (PLS)

CHAPTER IV:

RESULTS

The results are presented in 14 sections as follows (a) Screening and Cleaning of Data; (b) Demographic Characteristics of Participants; (c) Contextual Characteristics of Participants; (d) Descriptive Analysis of EBBS scores; (e) Research Questions (1, 2, 3, 4, 5, 6, 7, 8, and 9) and (f) Summary.

Screening and Cleaning of Data

The response data for the DCQ and EBBS were screened for erroneous and missing values. There were 17 missing values from the KSA respondents, and 23 missing values from the USA respondents. All respondents who provided missing values were excluded. After cleaning the data, the total sample size was N = 211 participants, of which n = 109, 51.7% attended school in the KSA, and n = 102, 48.3% attended school in the USA.

Demographic Characteristics of Participants

The demographic characteristics of the participants are summarized in Table 4. Two groups of participants were surveyed (KSA Univeristy of Hafr Al batin and USA Middle Tennessee State University). The participants ranged in age from 18 to over 25 years. The largest KSA age group was 18 to 21 (n = 79, 72.5%), whereas the largest USA age-group was over 25 (n = 57, 55.9%). The majority of the KSA participants were single (n = 84, 77.1%) whereas the majority of the USA participants were married (n = 72, 70.6%). The BMI categories of both groups of participants ranged from underweight (< 18.5 kg/m^2) to obese (> 30 kg/m^2). The most frequent BMI category was normal weight (18.5 to 25 kg/m^2) among the KSA participants (n = 69, 63.3%) and USA participants (n = 58, 56.9%). Obesity was more frequent among the USA participants (n = 14, 13.7%) than among the KSA participants (n = 7, 6.4%). The education level

of all but one of the KSA participants (n = 108, 99.1%) was a Bachelor's degree. Higher proportions of the USA participants had Master's degrees (n = 32, 31.4%).

Table 4

Demographic Characteristics of Participants

Characteristic	Category	KSA (n = 109)		USA (n = 102)	
		n	Percent	n	Percent
Age (Years)	18 to 21	79	72.5%	15	14.7%
	22 to 25	25	22.9%	30	29.4%
	> 25	5	4.6%	57	55.9%
Marital Status	Single	84	77.1%	27	26.5%
	Married	23	21.1%	72	70.6%
	Divorced	2	1.8%	3	2.9%
BMI Category	Underweight	12	11.0%	4	3.9%
	Normal (healthy) Weight	69	63.3%	58	56.9%
	Overweight	21	19.3%	26	25.5%
	Obese	7	6.4%	14	13.7%
Education Level	Bachelor	108	99.1%	67	65.7%
	Master	1	0.9%	32	31.4%
	Ph.D.	0	0.0%	3	2.9%

Contextual Characteristics of Participants

The contextual characteristics of the participants are summarized in Table 5.

Table 5

Contextual Characteristics of Participants

Characteristic	Category	KSA (n = 109)		USA (n = 102)	
		n	Percent	n	Percent
Membership of Sports Club	Yes	9	8.3%	32	31.4%
	No	100	91.7%	70	68.6%
Studied PE/Health Education	Yes	83	76.1%	40	39.2%
	No	26	23.9%	62	60.8%
Participated/Attended Health Workshop	Yes	57	52.3%	48	47.1%
	No	52	47.7%	54	52.9%

Table 5 Cont.

Characteristic	Category	KSA (n = 109)		USA (n = 102)	
		n	Percent	n	Percent
Types of Physical Activity	None	1	0.9%	0	0.0%
	Walking	72	66.1%	47	46.1%
	Running	3	2.8%	8	7.8%
	Physical Fitness	14	12.8%	32	31.4%
	Ball sports	2	1.8%	0	0.0%
	Other activities	17	15.6%	15	14.7%

A higher proportion of USA participants (n = 32, 31.4%) than KSA participants (n = 9, 8.3%) were members of sports clubs. The majority of KSA participants (n = 83, 76.1%) had studied PE/Health Education, while a minority of USA participants (n = 40, 39.2%) had done so. The proportions of participants who had participated /attended a PE/Health Education Workshop were similar in the KSA (n = 57, 52.3%) and the USA (n = 48, 47.1%). The most frequent physical activity reported by the participants was walking, in both the KSA (n = 72, 66.1%) and USA (n = 47, 46.1%). The participants in the USA reported more physical fitness activities (n = 32, 31.4%) than in the KSA (n = 14, 12.8%).

Table 6 summarizes the descriptive statistics for the participants' frequency and duration of exercise. Kolmogorov-Smirnov Z statistics indicated that the frequencies of the days of exercise per week, and the duration of exercise per week (minutes) deviated significantly from normality ($p < .05$). Consequently, parametric statistics (e.g., mean and standard deviation) were not justified. The median was a less biased estimate of central tendency than the mean.

Table 6

Descriptive Statistics for Participants' Frequency and Duration of Exercise

Statistics	Days of exercise per week		Duration of exercise per week	
	KSA	USA	KSA	USA
M	2.50	2.38	82.29	130.49
SD	2.26	1.94	88.76	132.09
Mdn	2.00	2.00	60.00	95.00
Z	2.42	1.56	3.19	1.85
P	<.001*	.016*	<.001*	.002*

Note: Significant deviation from normality ($p < .05$)

The frequency distribution histograms in Figure 1 explain why the participants' frequency and duration of exercise were not normally distributed. The frequency distributions were strongly skewed with the highest frequencies on the left hand side. The modes (highest frequencies) for days per week of exercise were one to two days for KSA participants and zero to four for USA participants. The modes for the duration of exercise were zero to 50 for both KSA and USA participants.

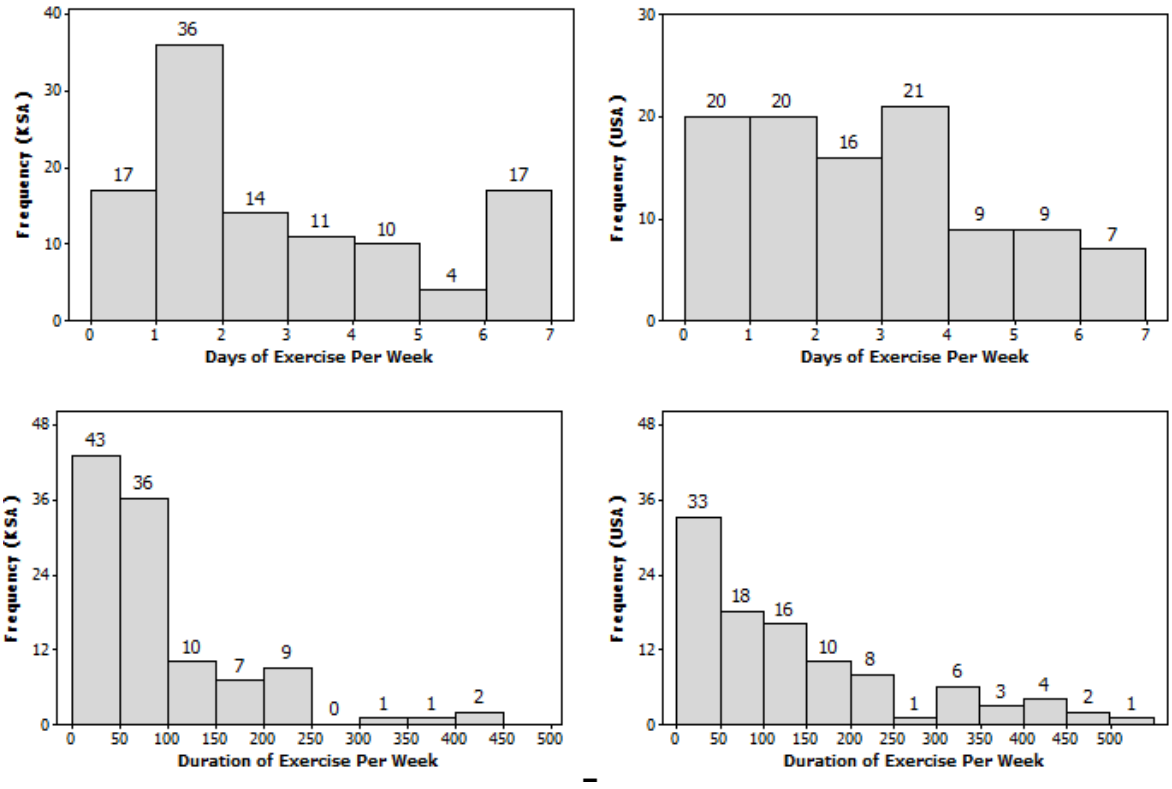

Figure 1. Frequency distributions of participants' frequency and duration of exercise

Descriptive Analysis of EBBS Scores

The results of the factor analysis are summarized in Table 7. Seven items were extracted, each consisting of items with strong loading coefficients (.403 to .765). The proportion of the variance in the data explained by the seven factors was 55.72%. Factor 1 explained the highest proportion of the variance (25.04%) and Factor 7 explained the smallest proportion (2.72%). There was no statistical evidence to justify computing the mean scores for the ten factors defined by Sechrist et al. (1987) listed in Table 1, because these ten factors were not confirmed.

Table 7

Results of Factor Analysis

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Eigenvalue	10.77	5.52	1.95	1.76	1.56	1.24	1.17
% of Variance	25.04%	12.84%	4.54%	4.10%	3.62%	2.88%	2.72%
Item	Factor Loading Coefficients						
21	.765						
33	.759						
40	.684						
28	.650						
37	.627						
12	.610						
09	.608						
24	.606						
14	.603						
42	.561						
19	.452						
41		.712					
35		.672					
43		.655					
36		.599					
34		.585					
32		.561					
13		.531					
15		.442					
30			.679				
25			.642				
11			.600				
29			.590				
27			.587				
31			.567				
38			.506				
39			.462				
17			.455				
26			.422				
23			.403		.		
08				.679			
20				.624			
07				.578			
18				.555			
22				.518			
02					.739		
03					.711		
01					.602		
10					.469		
05					.451		
04						.680	
06					.	.641	
16							.625

The Barriers items were classified into two factors: Factor 1, with 11 items (09, 12, 14, 21, 24, 28, 33, 37, 40, 42 and 49) and Factor 6, with 2 items (4 and 6). The five Barrier factors (Exercise Milieu, Time Expenditure, Physical Exertion, Family Encouragement, and Facility Obstacles) defined by Sechrist et al. (1987) were not extracted.

The Benefits items are classified into five factors: Factor 2, with eight items (13, 15, 32, 34, 35, 36, 41, and 43); Factor 3 with 11 items (11, 17, 23, 25, 26, 27, 29, 30, 31, 38, and 39); Factor 4 with six items (07, 08, 18, 20 and 22); Factor 5 with five items (01, 02, 03, 05 and 10) and Factor 7 with one item (16). The five Benefits factors (Life Enhancement (Psycho-Social), Physical Performance, Psychological Outlook, Social Interaction Preventive Health (Body Characteristics) defined by Sechrist et al. (1987) were not extracted.

Table 8 presents the reliability statistics for the Exercise Barriers and Exercise Benefits Scales. Because the internal consistency reliability of the scales was good (Cronbach's alpha = .825 to .954) it was justified to composite the scores by averaging.

Table 8

Reliability and Descriptive Statistics for Exercise Barriers and Benefits Scales

Statistics	Exercise Barriers Scale		Exercise Benefits Scale	
	KSA	USA	KSA	USA
Cronbach's α	.825	.899	.914	.954
M	2.60	2.79	3.25	3.27
SD	0.54	0.62	0.43	0.47
Z	1.23	1.34	0.84	0.74
P	0.097	.055	.472	.650

Kolmogorov-Smirnov Z statistics indicated that the Exercise Barriers and Benefits Scales did not deviate significantly from normality ($p > .05$), justifying the use of parametric statistics (e.g., mean, standard deviation, and confidence intervals) to summarize the scales.

Research Question 1

This section presents the statistical evidence to address RQ1: Is there a difference between KSA and USA regarding the strength of their Exercise Benefits to physical activity? Because the Exercise Benefits Scale was normally distributed (see Table 8) parametric statistics were justified to summarize the scores. Table 9 presents the means and standard deviations of the scores for each of the 29 items in the Exercise Benefits Scale. The Exercise Benefits Scale ranged from 1 to 4, and for 24 items, the mean score was greater than 3 reflecting agreement. The mean scores were less than 3, reflecting disagreement by the KSA participants for only three items (My disposition is improved with exercise; I will live longer if I exercise; Exercise helps me decrease fatigue) and by both the KSA and USA participants for only two items (Exercising lets me have contact with friends and persons I enjoy; Exercising is a good way for me to meet new people).

An independent samples t-test was used to address RQ1 using the composited scores for the 29 items. The results of a two-tailed t-test, assuming equal variances ($t(209) = -0.22$, $p = .827$) indicated that there was no significant difference between the mean scores for the Exercise Benefits scale with respect to the participants in the KSA ($M = 3.25$) and the USA ($M = 3.27$). Consequently, there was no significant statistical evidence to determine if there was a difference between KSA and USA regarding the strength of their Exercise Benefits to physical activity.

Table 9

Descriptive Statistics for Items in the Exercise Benefits Scale

Item	KSA		USA	
	M	SD	M	SD
I enjoy exercise.	3.37	0.75	3.26	0.70
Exercise decreases feelings of stress and tension for me.	3.48	0.75	3.49	0.69
Exercise improves my mental health	3.25	0.78	3.41	0.76
I will prevent heart attacks by exercising.	3.15	0.73	3.37	0.72
Exercise increases my muscle strength.	3.36	0.70	3.43	0.65
Exercise gives me a sense of personal accomplishment	3.43	0.74	3.43	0.68
Exercising makes me feel relaxed	3.30	0.78	3.41	0.71
Exercising lets me have contact with friends and persons I enjoy.	2.64	0.95	2.69	0.88
Exercising will keep me from having high blood pressure.	3.32	0.71	3.32	0.66
Exercising increases my level of physical fitness	3.61	0.58	3.42	0.78
My muscle tone is improved with exercise	3.28	0.82	3.28	0.71
Exercising improves functioning of my cardiovascular system	3.42	0.71	3.45	0.57
I have improved feelings of well-being from exercise.	3.19	0.81	3.31	0.69
Exercise increases my stamina.	3.36	0.78	3.28	0.72
Exercise improves my flexibility	3.53	0.73	3.43	0.61
My disposition is improved with exercise	2.96	0.88	3.04	0.78
Exercising helps me sleep better at night.	3.20	0.79	3.22	0.78
I will live longer if I exercise.	2.75	1.00	3.29	0.68
Exercise helps me decrease fatigue	2.98	0.89	3.21	0.68
Exercising is a good way for me to meet new people.	2.82	0.95	2.96	0.83
My physical endurance is improved by exercising.	3.40	0.73	3.33	0.67
Exercising improves my self-concept.	3.27	0.82	3.28	0.70
Exercising increases my mental alertness.	3.09	0.83	3.08	0.78
Exercise allows me to carry out normal activities without becoming tired	3.37	0.78	3.26	0.66
Exercise improves the quality of my work.	3.24	0.79	3.24	0.68
Exercise is good entertainment for me.	3.37	0.79	3.22	0.74
Exercising increases my acceptance by others	3.08	0.94	2.86	0.89
Exercise improves overall body functioning for me.	3.55	0.63	3.36	0.64
Exercise improves the way my body looks	3.61	0.65	3.63	0.60

Research Question 2

This section presents the statistical evidence to address RQ2: Is there a difference between KSA and USA regarding the strength of their Exercise Barriers to physical activity? Because the Exercise Barriers Scale was normally distributed (see Table 7) parametric statistics

were justified to address RQ2. Table 10 presents the means and standard deviations of the scores for each item in the Exercise Barriers Scale. The KSA participants consistently had lower mean item scores than the USA participants, apart from one item (Exercising takes too much of my time).

Table 10

Descriptive Statistics for Items in the Exercise Barriers Scale

Item	KSA		USA	
	M	SD	M	SD
Exercising takes too much of my time.	2.73	0.78	2.54	0.85
Exercise tires me.	2.44	0.90	2.54	0.92
Places for me to exercise are too far away.	2.04	0.92	2.58	0.98
I am too embarrassed to exercise.	3.11	0.99	3.14	0.92
It costs too much to exercise.	2.83	0.95	2.89	0.89
Exercise facilities do not have convenient schedules for me	2.23	0.87	2.52	0.83
I am fatigued by exercise.	2.69	0.94	2.93	0.84
My spouse (or significant other) does not encourage exercising.	2.67	1.16	3.03	0.96
Exercise takes too much time from family relationships.	2.52	0.94	2.59	0.92
I think people in exercise clothes look funny.	3.14	1.00	3.16	1.03
My family members do not encourage me to exercise.	2.75	1.12	2.99	1.09
Exercise takes too much time from my family responsibilities.	2.50	1.00	2.76	0.98
Exercise is hard work for me.	2.84	0.99	2.83	0.98
There are too few places for me to exercise.	1.96	0.99	2.53	0.98

An independent samples t-test was used to address RQ2 using the composited scores for the 14 items. The results of a one-tailed t-test, assuming equal variances ($t(209) = -2.30$, $p = .011$) indicated that the strength of the Exercise Barriers was significantly lower in the KSA participants ($M = 2.60$) than in the USA participants ($M = 2.79$).

The effect size, computed as the mean difference (0.19) divided by the pooled standard deviation (0.58) was, however, very weak (Cohen's $d = 0.32$). Although the mean difference

was statistically significant, the mean difference in the Exercise Barriers Scale between the KSA and USA had no practical significance, implying that it was too small to be meaningful. This interpretation follows the criterion of Ferguson (2009) that the recommended minimum value of Cohen's d representing a practically significant effect for social science data is 0.4.

Table 11

Descriptive Statistics for Exercise Barriers Scale Classified by Age and Marital Status

Age (Years)	M	SD	Marital Status	M	SD
18 to 21	2.65	0.57	Single	2.64	0.57
22 to 25	2.72	0.54	Married	2.77	0.61
>25	2.74	0.65			

The majority of the KSA participants were single (n = 84, 77.1%) whereas the majority of the USA participants were married (n = 72, 70.6%). Table 12 shows that mean score for the Exercise Barriers Scale was lower among the single participants (M = 2.64) than among the married participants (2.77). Consequently, another reason to explain why the strength of the Exercise Barriers was significantly lower among the KSA participants than the USA participants was that most of the KSA participants were single and most of the USA participants were married. Further statistical evidence for the influence of marital status on increasing the Exercise Barriers scale is provided in Table 10. The mean scores were higher among the USA participants for those items related to marital status (e.g., My spouse (or significant other) does not encourage exercising; Exercise takes too much time from family relationships; My family members do not encourage me to exercise; and Exercise takes too much time from my family responsibilities).

Research Question 3

This section presents the statistical evidence to address RQ3: Is there an association between school attendance (in KSA or USA) and membership in a sports club? The cross-

tabulation of the observed and expected frequencies is presented in Table 12.

Table 12

Cross-tabulation of School Attendance vs. Membership in a Sports Club

		Membership of Sports Club	
		Yes	No
KSA	Observed	9	100
	Expected	21.2	87.8
USA	Observed	32	70
	Expected	19.8	82.2

A Pearson's Chi-Square test indicated a statistically significant association between school attendance (in the KSA or USA) and membership in a sports club (Chi-Square (1) = 17.98, $p < .001$). The effect size (Cramer's V = .292) was moderately strong, reflecting practical significance. The reason for the significant association was that the observed frequency of participants in the USA who were members of a sports club (32) was greater than expected (19.8) whereas the observed frequency of participants in the KSA who were members of a sports club (9) was less than expected (21.2).

Research Question 4

This section presents the statistical evidence to address RQ4: Is there an association between school attendance and studying PE /health education? The cross-tabulation of the observed and expected frequencies is presented in Table 13.

Table 13

Cross-tabulation of School Attendance vs. Studied PE/Health Education

		Studied PE/Health Education	
		Yes	No
KSA	Observed	83	26
	Expected	63.5	45.5
USA	Observed	40	62
	Expected	59.5	42.5

A Pearson's Chi-Square test indicated a significant association between school attendance (in the KSA or USA) and studying PE/Health Education (Chi-Square (1) = 29.56, $p < .001$) with a moderately strong effect size (Cramer's V = .374) reflecting practical significance. The reason for the significant association was that the observed frequency of participants in the KSA who studied PE/Health Education (83) was greater than expected (63.5) whereas the observed frequency of participants in the USA who studied PE/Health Education (40) was less than expected (59.5).

Research Question 5

This section presents the statistical evidence to address RQ5: Is there an association between school attendance (in KSA or USA) and attending/participating in PE /health workshop? The cross-tabulation of the observed and expected frequencies is presented in Table 14. Pearson's Chi-Square test indicated no significant association between school attendance (in the KSA or USA) and attending/participating in a workshop (Chi-Square (1) = 0.58, p =.447) with a negligible effect size (Cramer's V = .052) reflecting no practical significance. The reason for no significant association was that the observed frequencies did not deviate from the expected frequencies.

Table 14

Cross-tabulation of School Attendance vs. Attending/Participating in Workshop

		Attended/Participated in Workshop	
		Yes	No
KSA	Observed	57	52
	Expected	54.2	54.8
USA	Observed	48	54
	Expected	50.8	51.2

Research Question 6

This section presents the statistical evidence to address RQ6: Is there a difference between KSA and USA regarding their number of days of exercise? Because the number of days of exercise deviated from normality (see Table 6) an independent samples t-test was not justified to address RQ6. Consequently, a Mann-Whitney test, (the non-parametric alternative to a t-test) was used. The results of the test ($Z(211) = -.12$, $p = .907$) indicated that there was no significant difference between the median days of exercise of participants in the KSA (Mdn = 2.00) and USA (Mdn = 2.00).

Research Question 7

This section presents the statistical evidence to address RQ7: Is there a difference between KSA and USA regarding their duration of exercise? Because the duration of exercise deviated from normality (see Table 6) a Mann-Whitney test was used to address RQ7. The results of the test ($Z(211) = -2.27$, $p = .023$) indicated a significant difference between the median duration of exercise of participants in the KSA (Mdn = 60.00) and USA (Mdn = 95.00). The effect size, given by $Z/\sqrt{N}$ (Fritz, Morris, & Richler, 2011) was .156, indicating that the

difference between KSA and USA regarding their duration of exercise had limited practical significance.

Research Question 8

This section presents the statistical evidence to address RQ8: Do school attendance (in KSA or USA) and strength of Exercise Benefits and Exercise Barriers to physical activities predict an individual's number of days of exercise? The dependent variable (days of exercise) deviated strongly from normality (see Table 6). A non-parametric method was therefore used to address RQ8. Figure 2 presents the results of the path analysis obtained using the graphic user interface of SmartPLS. The numbers next to the arrows are the path coefficients (β) equivalent to the partial regression coefficients in a multiple regression model.

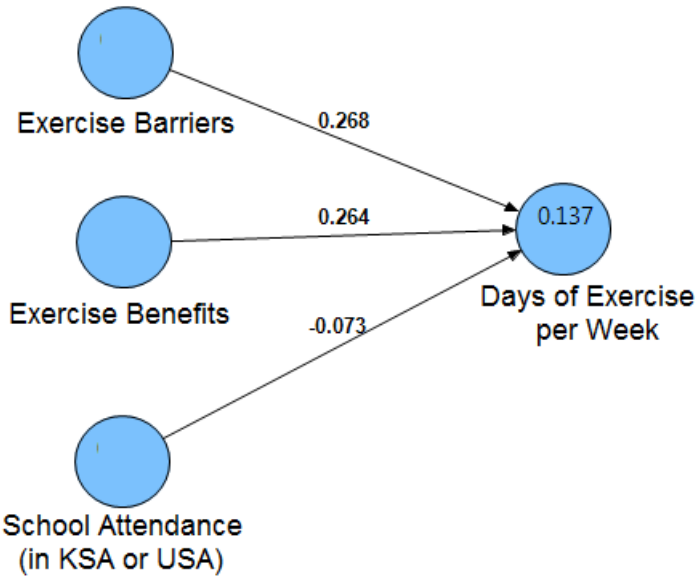

Figure 2. PLS path analysis to predict Days of Exercise per Week

Exercise Barriers was a significant predictor of Days of Exercise per Week (β = .268) indicated by the results of a t-test (t = 4.25, p <.001). Exercise Benefits was also a significant predictor of Days of Exercise per Week (β = .264, t = 4.30, p <.001). School Attendance (in KSA

or USA) was, however, not a significant predictor (β = -.073, t = 1.41, p = .159). The effect size (R^2 = .137) indicated that a relatively small proportion of the variance in Days of Exercise per Week (13.7%) was explained, reflecting limited practical significance (Ferguson, 2009).

Research Question 9

This section presents the statistical evidence to address RQ9: Do school attendance (in KSA or USA) and strength of Exercise Benefits and Exercise Barriers to physical activities predict an individual's duration of exercise? Figure 3 presents the results of the path analysis to address RQ9.

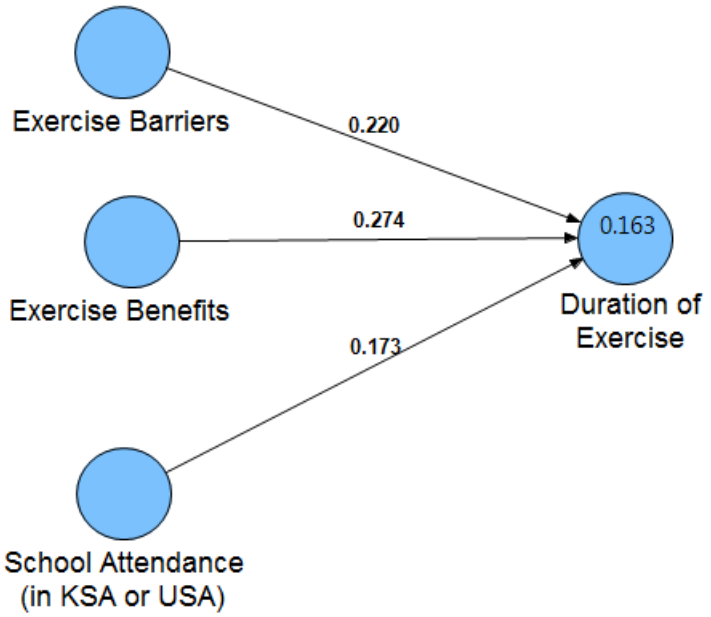

Figure 3. PLS path analysis to predict Duration of Exercise

Exercise Barriers was a significant predictor of Duration of Exercise (β = .220, t = 3.84, p <.001) as was Exercise Benefits (β = .274, t = 5.21, p <.001). School Attendance (in KSA or USA) was also a significant predictor (β = .173, t = 2.95, p = .003). The effect size (R^2 = .163)

indicated that a relatively small proportion of the variance in Duration of Exercise (16.3%) was explained, reflecting limited practical significance (Ferguson, 2009).

Summary

The answers to the nine research questions are summarized in Table 15

Table 15

Answers to Research Questions

Research Question	Answer
RQ1. Is there a difference between KSA and USA regarding the strength of their Exercise Benefits to physical activity?	A t-test indicated no significant difference between participants in the KSA and USA regarding the strength of their Exercise Benefits.
RQ2. Is there a difference between KSA and USA regarding the strength of their Exercise Barriers to physical activity?	A t-test indicated that the strength of the Exercise Barriers was significantly lower among the KSA participants than the USA participants. The effect size, however, very weak, reflecting limited practical significance. Furthermore, demographic characteristics (age and marital status) confounded the results.
RQ3. Is there an association between School Attendance and membership in a sports club?	A Pearson's Chi-Square test indicated a significant association between school attendance (in the KSA or USA) and membership in a sports club, with a moderately strong effect size, reflecting practical significance.
RQ4. Is there an association between School Attendance and studying PE /health education?	A Pearson's Chi-Square test indicated a significant association between school attendance (in the KSA or USA) and studying PE/Health Education, with a moderately strong effect size, reflecting practical significance.

Table 15 Cont.

Research Question	Answer
RQ5. Is there an association between School Attendance and Attending PE /health workshop?	Pearson's Chi-Square test indicated no significant association between school attendance (in the KSA or USA) and attending/participating in a workshop, with a negligible effect size.
RQ6. Is there a difference between KSA and USA regarding their number of days of exercise?	A Mann-Whitney test indicated that there was no statistically significant difference between the median days of exercise of participants in the KSA and USA
RQ7. Is there a difference between KSA and USA regarding their duration of exercise?	A Mann Whitney test indicated a statistically significant difference between the median duration of exercise of participants in the KSA and USA, but with a low effect size, reflecting limited practical significance.
RQ8. Do School Attendance and strength of Exercise Benefits and Exercise Barriers to physical activities predict an individual's number of days of exercise?	Partial least squares path analysis indicated that Exercise Benefits and Exercise Barriers were significant predictors of Days of Exercise per Week. School Attendance (in KSA or USA) was, however, not a significant predictor. The effect size indicated that a relatively small proportion of the variance in Days of Exercise per Week was explained, reflecting limited practical significance.
RQ9. Do School Attendance and strength of Exercise Benefits and Exercise Barriers to physical activities predict an individual's duration of exercise?	Partial least squares path analysis indicated that School Attendance, Exercise Benefits, and Exercise Barriers were significant predictors of Duration of Exercise. The effect size indicated that a relatively small proportion of the variance in Duration of Exercise was explained, reflecting limited practical significance.

CHAPTER V:

DISCUSSION

The purpose of this descriptive quantitative study was to assess and compare the perceived benefits of physical activity and barriers to physical activity among female Saudi university students in the KSA, and in the USA. This chapter presents a discussion of the findings. The first section provides an interpretation of the results of the statistical analysis. The descriptive statistics and the statistical evidence to answer the nine research questions are interpreted in the context of the literature. The second section considers the implications of the results with respect to social action and future study.

Interpretation of Results

The instrument used to collect the quantitative data was the Exercise Benefits/ Barriers scale (EBBS) originally created by Sechrist et al. (1987) as a means to understand how people perceive engaging in exercise. The developers of this instrument suggested that the item scores could be classified into ten factors. A factor analysis was conducted to determine if these ten factors could also be extracted from the data collected in the current study. Seven factors were extracted from the 43 item scores. The five Barrier factors (Exercise Milieu, Time Expenditure, Physical Exertion, Family Encouragement, and Facility Obstacles), and the five Benefits factors (Life Enhancement (Psycho-Social), Physical Performance, Psychological Outlook, Social Interaction Preventive Health (Body Characteristics) defined by Sechrist et al. (1987) were not extracted. There was, therefore, no statistical evidence to justify computing the mean scores for each of the ten factors.

An explanation for this discrepancy is the “indeterminancy” of factor analysis (Grice, 2001). Indeterminancy means that the factors are not always the same when they are extracted

from data collected by one instrument using different samples, from different populations, at different times, and in different places. Indeterminacy arises because factors cannot be uniquely defined. Theoretically, there is an infinite number of solutions when factor analysis is conducted on the item scores collected using one instrument (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Therefore, it is not justified to use the factors defined by one researcher based on data collected from one sample of participants when an instrument is administered by another researcher to another sample of participants.

Evidence was provided based on the composited items scores for 29 items in the EBBS to address the first research question: Is there a difference between KSA and USA regarding the strength of their Exercise Benefits to physical activity? The Exercise Benefits Scale ranged from 1 to 4, and the mean score was > 3 for participants in the KSA (M = 3.25) and the USA (M = 3.27). Reflecting agreement with the statements. The strongest endorsement from both the KSA and USA participants, reflected by a mean score > 3.6, was for the item: Exercise improves the way my body looks. This finding was consistent with previous surveys, based on the administration of the EBBS among undergraduate students in the USA and UK, suggesting the most important perceived benefits were concerned with physical appearance (Brown, 2005; Grubbs & Carter, 2002; Lovell, et al., 2010). The finding was also consistent with those reported by Samara, et al. (2015) conducted with female students in the KSA, concluding that these participants had good knowledge of the benefits of physical activity. The current study has revealed the new finding that, irrespective of whether female Saudi students attend universitys in the KSA or USA, they both appear to equally perceive the strength of their Exercise Benefits to physical activity. A reason for citing exercise improves the way my body looks most frequently could be that females are more concerned with looking in shape and attractive. Conversely, the

benefits “Exercise is a good way for me to meet new people” and “Exercising lets me have contact with friends and persons I enjoy” were the lowest scoring items among both groups. Culturally, females tend to be less social with strangers, especially in public areas. For example, Saudi females in sports clubs are less likely to approach and engage in conversation with other females they don’t know.

Evidence was provided based on the composited items scores for 14 items in the EBBS to address the second research question: Is there a difference between KSA and USA regarding the strength of their Exercise Barriers to physical activity? The most frequently cited barriers for both the USA and KSA groups were “I am too embarrassed to exercise” and “I think people in exercise clothes look funny”. These barriers are consistent with Alsahli’s (2016) results, which found that female students at Kuwait University cited feeling embarrassed by “How I see my body”. An explanation for this result could be that the Saudi culture does not encourage females to wear tight clothing or sports clothes that show the appearance of the body. For Saudi females, it is unusual to see women in exercise clothing, particularly bright and tight clothes. With regards to female k-12 and university students, it is best to have a standard uniform for physical education courses. These uniforms should adhere to cultural customs and be made in a specific set of colors and provide comfort for practicing physical activity.

The KSA participants consistently had lower mean item scores than the USA participants, apart from one item (Exercising takes too much of my time). Several other studies have also shown the tendencies of students in Asia and the Middle East to cite lack of time as a significant barrier to physical activity (Abdullah et al., 2005; Al-Otaibi, 2013, Daskapan, et al., 2006; El-Gilany & El-Masry 2011; Romaguera, et al., 2011). Qahoush et al. (2010) in a survey of sample of Arabic women in the USA, reported that the most frequently cited barrier was a

lack of time. One explanation for the KSA participants citing lack of time more frequently could be that facilities are limited and those wanting to use exercise facilities have to drive a long distance to get to them. Laziness could be another excuse for not making physical activity a part of their daily schedule.

The results of a t-test indicated that the strength of the Exercise Barriers was significantly lower among the KSA participants (M = 2.60) than among the USA participants (M = 2.79). This finding was unexpected, because it was not consistent with previous studies, suggesting that there are many strong barriers to participating in physical activity and using public and private facilities for Saudi female university students. According to Samara, et al. (2015) for female students in particular, a lack of facilities and little support from the university act as major barriers to physical activity.

The finding that the KSA students perceived that they experienced less barriers to physical activity than the USA students, however, had limited practical significance because the effect size was very low (based on the criteria of Ferguson, 2009). Furthermore, the internal validity of the results of the t-test was threatened by inequalities in the demographic characteristics of the participants in the KSA and USA. The differences between the Exercise Barriers Scale for the KSA and USA participants were confounded by their demographic characteristics. The KSA participants were younger than the USA participants. In the KSA the largest age group was 18 to 21 (n = 79, 72.5%) whereas the largest USA age-group was over 25 (n = 57, 55.9%). Table 11 shows that the Exercise Barriers Scale tended to increase with respect to the ages of the participants, ranging from M = 2.64 at age < 21 years, to M = 2.74 at age > 25 years. Additionally, education level may have impacted results. The majority of the participants in the KSA were Bachelors students (99.1%), while a significant portion of participants in the

USA was graduate students (31.4% Masters, 2.9% Ph.D.). When interpreting the results of a t-test, to determine if one independent variable has a statistically significant effect on one dependent variable then it is essential to consider whether (a) this result is exclusive, because other independent variables that were not included in the test may also have an effect on the dependent variable (Lindsay, 1995).

In the current study, the USA sample contained older married students than the KSA sample. The older married women tended to perceive greater barriers to physical activity than the younger single women, indicated by higher scores for items such as : My spouse (or significant other) does not encourage exercising; Exercise takes too much time from family relationships; and My family members do not encourage me to exercise". Menon (2008) working in the USA similarly reported that home and family responsibilities were frequently cited as a barrier to physical activity among married women (Menon, 2008). Qahoush et al. (2010) also found that taking time away from family, and a lack of support from family, acted as barriers to married Arab women in the USA.

Consequently, the finding that the strength of the Exercise Barriers was significantly lower among the KSA participants than among the USA participants appeared to be a limitation of the t-test. The differences in the perceived barriers to physical activity were probably not caused by the differences in the locations of the schools that the participants attended. These differences were probably associated with the inequalities in the demographic characteristics of the two groups of participants, particularly with respect to their age and marital status.

Statistical evidence was provided to address the third research question: Is there an association between School Attendance and membership in a sports club? There was a significant association between school attendance and membership in a sports club, with a

moderately strong effect size, reflecting practical significance. A higher proportion of KSA participants (n = 100, 91.7%) than USA participants (n = 70, 68.6%) were not members of sports clubs. An explanation for this difference is that in larger cities like Riyadh and Jeddah in KSA have sports clubs and other places for physical activity, but they are not open to women. The KSA lacks the infrastructure to encourage higher rates of female participation in sports clubs (Al-Hazzaa, 2004; Alghenaim, 2013).

Statistical evidence was provided to address the fourth research question: Is there an association between School Attendance and studying PE /health education? A Pearson's Chi-Square test indicated a significant association between school attendance and membership in a sports club, with a moderately strong effect size, reflecting practical significance. The reason for the association was that the proportions of participants in the KSA who studied PE/Health Education was greater than the proportions of participants in the USA who studied PE/Health Education and attended sports clubs. An explanation for this finding is that female Saudi students in the KSA not only have limited access to sports clubs, compared to their counterparts in the USA, they are also discouraged from physical activity by lack of physical education. Until recently, there has been no PE for girls k-12. Schools are segregated by gender, so that female students are taught in entirely different buildings to male students, and female students are not offered any physical education (Al-Hazzaa, 2004; Alghenaim, 2013; Samara et al., 2015).

Statistical evidence was presented to address the fifth research question: Is there an association between school attendance and attending/participating in PE/ Health workshop? Pearson's Chi-Square test indicated no significant association with a negligible effect size. The majority of the participants in the USA and KSA had not attended a PE/Health workshop, indicating that such workshops are not popular. Limited data are available in the literature

regarding the impact of PE/Health workshops on students in the USA and elsewhere. According to Centers for Disease Control & Prevention (2010) further research is needed to understand how to incorporate PE/Health workshops into the curriculum, and how to provide appropriate professional development training for teachers to conduct PE/Health workshops.

Statistical evidence was presented to address the sixth research question: Is there a difference between KSA and USA regarding their number of days of exercise? A Mann-Whitney test was used, because the frequency distribution of number of days of exercise deviated from normality. The results indicated that there was no statistically significant difference between the median days of exercise of participants in the KSA (2 days) and the USA (2 days). This result was unexpected, because there is research evidence to indicate that female Saudi students have relatively low levels of physical activity compared to students in other countries (Al-Otaibi 2013; Samara et al., 2015). It is possible that this finding was incorrect, due to the deficiencies in the instrument used to measure physical activity. The accuracy of many instruments for measuring physical activity has been found to be very low (Ainsworth, Jacobs, & Leon, 1993; Jacobs, Ainsworth, & Hartman, 1993). The reliability and validity of the seven-day recall of physical activity reported by university students using many instruments is very poor (Dishman & Steinhardt, 1988). There is a need to improve the construction and administration of self reported questionnaires to measure the levels of physical activity in university students (MacKay, Schofield, & Schuter, 2007).

Statistical evidence was presented to address the seventh research question: Is there a difference between KSA and USA regarding their duration of exercise? A Mann Whitney test indicated a statistically significant difference between the median duration of exercise of participants in the KSA (60 minutes) and USA (95 minutes). This finding was consistent with

previous studies reporting that female Saudi students have relatively low levels of physical activity compared to students in other countries (Al-Otaibi 2013; Samara et al., 2015). The effect size, however, was very low, reflecting limited practical significance, and possibly reflecting the deficiencies in the validity of the self report instrument (MacKay, Schofield, & Schuter, 2007).

Statistical evidence was presented to address the eighth research question: Do school attendance and strength of Exercise Benefits and Exercise Barriers to physical activities predict an individual's number of days of exercise? PLS path analysis indicated that Exercise Barriers and Exercise Benefits were significant predictor of Days of Exercise per Week. School Attendance (in KSA or USA) was, however, not a significant predictor. This finding was consistent with the Health Belief Model (HBM) which is the theoretical framework applied to underpin the current study (Burak & Meyer, 1997). The statistical evidence supported the HBM model by showing that the level of participation in health-related behavior (i.e., number of days of exercise) for female Saudi students in the KSA and USA was directly related to their perceived barriers to exercise and their perceived benefits of exercise. Using Ferguson's (2009) criteria, the effect size, (R^2 = 13.7%) was relatively low, implying that only a small proportion of the variance in the numbers of days of exercise was explained, so that the model has limited clinical significance.

Statistical evidence was presented to address the ninth research question: Do school attendance and strength of Exercise Benefits and Exercise Barriers to physical activities predict an individual's duration of exercise? PLS path analysis indicated that Exercise Barriers and Exercise Benefits were significant predictors of duration of exercise. School Attendance was also a significant predictor, because of the statistically significant difference between the duration of exercise of participants in the KSA and USA. This finding was also consistent with the Health

Belief Model (Burak & Meyer, 1997). The statistical evidence supported the HBM model by showing that the level of participation in health-related behavior (i.e., duration of exercise) was directly related to the participants' perceived barriers to exercise and their perceived benefits of exercise. This relationship was stronger for USA participants compared to KSA participants. Using Ferguson's (2009) criteria, the effect size, (R^2 = 16.3%) was relatively low, implying that only a small proportion of the variance in the duration of exercise was explained, so that the model has limited clinical significance.

Implications for Social Action

These findings of the current study were consistent with the limited amount of previous research (Al-Otaibi 2013; Samara et al., 2015) indicating that Saudi female university students in the KSA generally tend to have a high level of belief in the benefits of physical activity; however, they tend not to engage in high levels of physical activity due to various perceived barriers. The implications are that social action is required to improve the levels of physical activity of Saudi female university students in the KSA. There is a necessity to introduce a physical activity intervention, as recommended elsewhere (USDHHS, 2010; Robbins, Pender, & Kazanis, 2003). For example, educational policy makers need to ensure that more PE is introduced into the academic curriculum to ensure that Saudi female university students experience at least the minimum levels of physical activity recommended by the Centers for Disease Control and Prevention. The CDC's (2006) recommendation is at least 150 minutes of moderate physical activity each week. This recommendation can be achieved through moderate-intensity physical activities (e.g., running, walking, stair climbing) that do not necessarily require access to formal facilities, such as sports clubs, gymnasiums, etc. This is an important

consideration, because most sports clubs and other organizations promoting physical activity are not open to Saudi women in the KSA (Samara et al., 2015).

Implications for Future Research

It is easy for a researcher to make recommendations, such as the need for educational policy makers to ensure that more PE is introduced into the academic curriculum, and that female Saudi students need to experience at least the minimum levels of physical activity per week. It is more difficult to implement such recommendations in practice, and to evaluate the extent to which these recommendations are effective. Consequently, a Plan-Do-Study-Act (PDSA) cycle (Deming, 1986) needs to be applied in future research. The PDSA cycle is recommended as the best practice for the implementation of health promotion programs (Healey & Zimmerman, 2010). A Plan-Do-Study- Act cycle for a proposed health promotion program with the goal of improving the physical activity levels of female Saudi students in KSA is illustrated in Figure 4. Less time, money, and risk is involved if a PDSA cycle is implemented on a small scale before implementing it more widely (Langley, Nolan, Norman, & Provost, 2009). Consequently, the proposed research should initially be conducted in the female section at one of the large Universities in the KSA (e.g., King Abdulaziz University, Jeddah). A defined population of students should be exposed to the intervention for a short trial period before it is subsequently developed across more Universities in the KSA. The proposed PDSA cycle design is outlined in Figure 4.

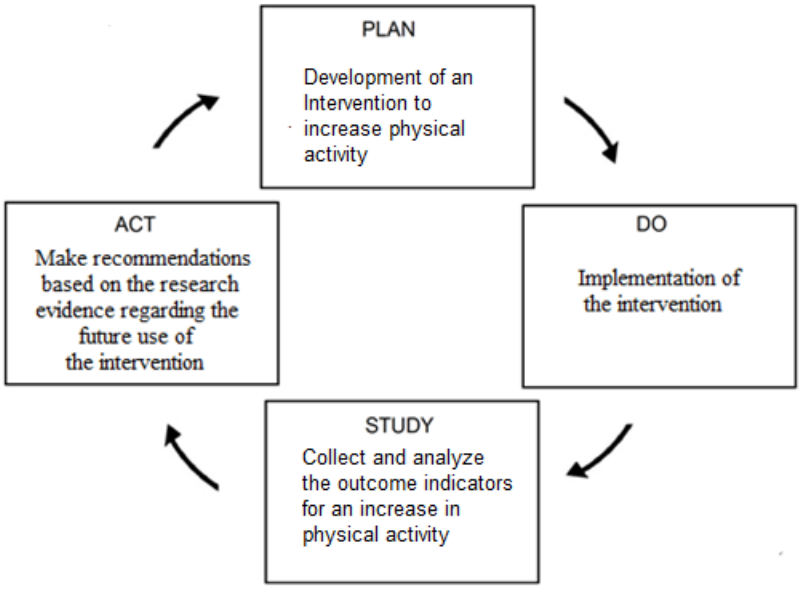

Figure 4. Recommended PDSA cycle

In the Plan phase, an appropriate intervention, involving a University wide coordinated approach, should be designed. An intervention team needs to be organized, consisting of healthcare professionals, as well as the faculty and academically-related staff at the University who support the need for health promotion. The intervention team should personally endeavor to assist each individual student's personal attempts to change her lifestyle by encouraging her to increase her levels of physical activity.

In the Do phase, the intervention should be implemented, for a trial period (e.g., covering the lifespan of one cohort of undergraduate female students at the University). In the Study Phase, the information collected from each student at the beginning and the end of the program, measuring the outcome indicators of her levels of physical activity should be analyzed. This analysis will determine if significant improvements in physical activity have taken place as a consequence of the intervention. The validity and reliability of the measurements of the physical

activities of students using self-report instruments is known to be problematic (Ainsworth et al., 1993; Dishman & Steinhardt, 1988; Jacobs et al., 1993; Mackay, et al. 2007). Consequently, an alternative method to estimate the personal levels of physical activity of each student should be developed. For example, rather than use self-report measures, the members of the intervention team could act as chaperones, to accompany the participants when they are undergoing physical activity, and to provide accurate measures, to determine if the participants experience at least the minimum levels of physical activity recommended by the Centers for Disease Control and Prevention. In the Act phase, the researcher will reflect on the findings of the Study Phase, and evaluate the effectiveness of the intervention. If the intervention is found to be ineffective, then the PDSA cycle must be repeated, using a different type of intervention (Healey & Zimmerman, 2010).

Conclusion

The benefits and barriers to physical activity among Saudi female university students in the KSA and USA were assessed and compared. The findings were consistent with the limited amount of previous research indicating that female Saudi students in the KSA generally tend to have a high level of belief in the benefits of physical activity; however, they tend not to engage in high levels of physical activity due to various perceived barriers. Social action is required to improve the physical activity levels of female students in the KSA. A Plan-Do-Study-Act cycle needs to be applied in future research. The PDSA cycle is recommended as the best practice for the implementation of a health promotion program for Saudi female university students.

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APPENDICES

APPENDIX A:

IRB Approval Forms

IRB
INSTITUTIONAL REVIEW BOARD
Office of Research Compliance,
010A Sam Ingram Building,
2269 Middle Tennessee Blvd
Murfreesboro, TN 37129

MIDDLE TENNESSEE STATE UNIVERSITY

IRBN001 - EXPEDITED PROTOCOL APPROVAL NOTICE

Tuesday, May 31, 2016

Investigator(s): Maali Saud Alsahli; Don Belcher
Investigator(s') Email(s): msa3h@mtmail.mtsu.edu; Don.Belcher@mtsu.edu
Department: Health and Human Performance

Study Title: BENEFITS AND BARRIERS TO PHYSICAL ACTIVITY AMONGSAUDI FEMALES COLLEGE STUDENTS IN THE KINGDOM OF SAUDI ARABIA AND THEUNITED STATES
Protocol ID: **16-2261**

Dear Investigator(s),

The above identified research proposal has been reviewed by the MTSU Institutional Review Board (IRB) through the **EXPEDITED** mechanism under 45 CFR 46.110 and 21 CFR 56.110 within the category *(7) Research on individual or group characteristics or behavior* A summary of the IRB action and other particulars in regard to this protocol application is tabulated as shown below:

IRB Action	APPROVED for one year from the date of this notification	
Date of expiration	**5/31/2017**	
Participant Size	Three Hundrend	
Participant Pool	**Female students at MTSU and UHA**	
Exceptions	None	
Restrictions	**None**	
Comments	n/a	
Amendments	**Date**	**Post-approval Amendments**
		Click here to enter text.

This protocol can be continued for up to THREE years (**5/31/2019**) by obtaining a continuation approval prior to **5/31/2017**. Refer to the following schedule to plan your annual project reports and be aware that you may not receive a separate reminder to complete your continuing reviews. Failure in obtaining an approval for continuation will automatically result in cancellation of this protocol. Moreover, the completion of this study MUST be notified to the Office of Compliance by filing a final report in order to close-out the protocol.

Continuing Review Schedule:

Reporting Period	Requisition Deadline	IRB Comments
First year report	5/1/2017	INCOMPLETE
Second year report	5/1/2018	INCOMPLETE
Final report	5/1/2019	INCOMPLETE

The investigator(s) indicated in this notification should read and abide by all of the post-approval conditions imposed with this approval. Refer to the post-approval guidelines posted in the MTSU IRB's website. Any unanticipated harms to participants or adverse events must be reported to the Office of Compliance at (615) 494-8918 within 48 hours of the incident. Amendments to this protocol must be approved by the IRB. Inclusion of new researchers must also be approved by the Office of Compliance before they begin to work on the project.

All of the research-related records, which include signed consent forms, investigator information and other documents related to the study, must be retained by the PI or the faculty advisor (if the PI is a student) at the secure location mentioned in the protocol application. The data storage must be maintained for at least three (3) years after study completion. Subsequently, the researcher may destroy the data in a manner that maintains confidentiality and anonymity. IRB reserves the right to modify, change or cancel the terms of this letter without prior notice. Be advised that IRB also reserves the right to inspect or audit your records if needed.

Sincerely,

Institutional Review Board
Middle Tennessee State University

Quick Links:

Click here for a detailed list of the post-approval responsibilities.
More information on expedited procedures can be found here.

To: Middle Tennessee State University IRB

Dr.

Sam H. Ingram Bldg. 011B

Murfreesboro, TN 37132

According to Ms. Maali Saud Alsahli request, we are glad to let you know that Ms. Alsahli can get her approval from your university. Moreover, our University would like to provide to you that Ms. Alsahli does not need IRB approval from us to conduct her study in Saudi Arabia.

If you have questions or concerns feel free to contact me.

Sincerely,

12/4/2016م

الموضوع

طلب موافقة لاجراء بحث علمي لدرجة الماجستير

السادة المحترمين

السلام عليكم ورحمة الله وبركاته ...

أتقدم أنا معالي سعود بداح السهلي "مبتعثة لدرجة الماجستير" بالولايات المتحدة الأمريكية ضمن برنامج خادم الحرمين الشريفين حفظه الله؛ لكم بكتابي هذا طلبة منكم الموافقة لأجراء بحث علمي لدرجة الماجستير بعنوان "الفوائد والمعوقات أمام ممارسة النشاط البدني لطالبات السعوديات في أمريكا والسعودية" وتطبيق الاستبانة و التي تهدف الى قياس مدى المعرفة بالفوائد والمعوقات أمام ممارسة النشاط البدني الطالبات السعوديات. سوف يتم طرح هذه الأستبانة على الطالبات من مختلف التخصصات العلمية خلال الفصل الحالي 2016.

وأنا على ثقة كبيرة بتقديركم واستجابتكم , علما بأن تعاونكم هذا سيظل مقدار أعتزاز وتقديرا لي.

مع خالص التحية والتقدير ,,,

المبتعثة

معالي سعود بداح السهلي

جامعة حفر الباطن
University of Hafr Al Batin

APPENDIX B:

English Version of the Exercise Benefits/Barriers Scale

Benefits And Barriers To Physical Activity Among
Saudi Females College Students In Kingdom of Saudi Arabia And The United States
Maali Saud Alsahli

1- Age: (1) 18-21 (2) 22-25 (3) Older than 25.

2- Marital status: (1) Single (2) Married (3) Divorced (4) Widowed.

3- Wight:_____Kg

4- Height:_____Cm

5- Educational Level: (1) Bachelor (2) Master (3) Ph.D.

6- Membership of sports clubs: (1) Yes (2) No.

7- Studied physical education or health education class: (1) Yes (2) No.

8- Participated or attended workshop about sport or health class: (1) Yes (2) No.

9- Number of days of exercise per week_____

10- Duration of exercise per week_____

11- Type of activity: (1) Walking (2) Running (3) Physical fitness (4) Ball sports. (5) Others

Benefits And Barriers To Physical Activity Among
Saudi Females College Students In Kingdom of Saudi Arabia And The United States
Maali Saud Alsahli

Exercise Benefits/ Barriers scale (EBBS)

At the bottom, some related statements to exercising. Please indicate how much you agree or disagree by placing (X) in the appropriate place

Items	Strongly Agree	Agree	Disagree	Strongly Disagree
1. I enjoy exercise.				
2. Exercise decreases feelings of stress and tension for me.				
3. Exercise improves my mental health.				
4. Exercising takes too much of my time.				
5. I will prevent heart attacks by exercising.				
6. Exercise tires me.				
7. Exercise increases my muscle strength.				
8. Exercise gives me a sense of personal accomplishment.				
9. Places for me to exercise are too far away.				
10. Exercising makes me feel relaxed.				
11. Exercising lets me have contact with friends and persons I enjoy.				
12. I am too embarrassed to exercise.				
13. Exercising will keep me from having high blood pressure.				
14. It costs too much to exercise.				
15. Exercising increases my level of physical fitness.				
16. Exercise facilities do not have convenient schedules for me.				
17. My muscle tone is improved with exercise.				
18. Exercising improves functioning of my cardiovascular system.				
19. I am fatigued by exercise.				
20. I have improved feelings of well-being from exercise.				

Benefits And Barriers To Physical Activity Among
Saudi Females College Students In Kingdom of Saudi Arabia And The United States
Maali Saud Alsahli

21. My spouse (or significant other) does not encourage exercising.				
22. Exercise increases my stamina.				
23. Exercise improves my flexibility.				
24. Exercise takes too much time from family relationships.				
25. My disposition is improved with exercise.				
26. Exercising helps me sleep better at night.				
27. I will live longer if I exercise.				
28. I think people in exercise clothes look funny.				
29. Exercise helps me decrease fatigue.				
30. Exercising is a good way for me to meet new people.				
31. My physical endurance is improved by exercising.				
32. Exercising improves my self-concept.				
33. My family members do not encourage me to exercise.				
34. Exercising increases my mental alertness.				
35. Exercise allows me to carry out normal activities without becoming tired.				
36. Exercise improves the quality of my work.				
37. Exercise takes too much time from my family responsibilities.				
38. Exercise is good entertainment for me.				
39. Exercising increases my acceptance by others.				
40. Exercise is hard work for me.				
41. Exercise improves overall body functioning for me.				
42. There are too few places for me to exercise.				
43. Exercise improves the way my body looks.				

The end of the questionnaire
Thank you for your participation

APPENDIX C:

Arabic Version of the Exercise Benefits/Barriers Scale

Benefits And Barriers To Physical Activity Among Saudi Females College Students

Maali Saud Alsahli

1. **العمر:** (أ) ١٨-٢١ (ب) ٢٢-٢٥ (ج) أكبر من ٢٥

2. **الحالة الاجتماعية:** (أ) عزباء (ب) متزوجة (ج) مطلقة (د) أرملة

3. **الوزن:** ____ كغم

4. **الطول:** ____ سم

5. **مستوى التعليم:** (أ) بكالوريوس (ب) ماجستير (ج) دكتوراه

6. **هل لكي عضوية فى أحد الأندية الرياضية أو الصحية؟** (أ) نعم (ب) لا

7. **هل درستي مادة تتعلق بالتربية الرياضية أو التربية الصحية؟** (أ) نعم (ب) لا

8. **هل شاركتي أو حضرتي ندوة أو دورة أو محاضرة تتعلق بالرياضة أو الصحة؟** (أ) نعم (ب) لا

9. **عدد مرات ممارسة النشاط الرياضي:** _____ / أسبوع

10. **مدة ممارسة النشاط الرياضي:** _____ / أسبوع

11. **نوع النشاط الرياضي:** (أ) المشي (ب) الركض (ج) تمارين اللياقة البدنية (د) رياضات الكرة (هـ) غير ذلك ____

Benefits And Barriers To Physical Activity Among Saudi Females College Students
Maali Saud Alsahli

ب- مقياس فوائد ومعوقات ممارسة التمارين الرياضية

في الأسفل، بعض الجمل ذات العلاقة بممارسة التمارين الرياضية. يرجى الإشارة إلى مدى موافقتك أو عدم موافقتك وذلك بوضع إشارة (X) في المكان المناسب

السؤال	أوافق بشدة	أوافق	لا أوافق	لا أوافق بشدة
1. أنا أستمتع بممارسة التمارين الرياضية				
2. ممارسة التمارين الرياضية تقلل من مشاعر التوتر والاجهاد بالنسبة لي.				
3. ممارسة التمارين الرياضية تحسن صحتي الذهنية				
4. ممارسة التمارين الرياضية تأخذ الكثير من وقتي				
5. سوف أمنع اصابتي بالنوبات القلبية من خلال ممارسة التمارين الرياضية				
6. ممارسة التمارين الرياضية تتعبني.				
7. ممارسة التمارين الرياضية تزيد قوة العضلات.				
8. ممارسة التمارين الرياضية تعطيني شعورا بالإنجاز الشخصي.				
9. أماكن ممارسة التمارين الرياضية بالنسبة لي بعيدة جدا.				
10. ممارسة التمارين الرياضية تجعلني أشعر بارتياح.				
11. ممارسة التمارين الرياضية تسمح لي بالبقاء على اتصال مع الأصدقاء والأشخاص الذين أستمتع معهم.				
12. أنا أشعر بحرج شديد بممارسة التمارين الرياضية.				
13. ممارسة التمارين الرياضية ستمنع وجود ارتفاع في ضغط الدم.				
14. ممارسة التمارين الرياضية تكلف الكثير من المال				
15. ممارسة التمارين الرياضية تزيد مستوى اللياقة البدنية لدي.				
16. مرافق ممارسة التمارين الرياضية ليس لديها جداول مريحة بالنسبة لي.				
17. تحسنت قوتي العضلية مع ممارسة التمارين الرياضية				
18. ممارسة التمارين الرياضية تحسن أداء جهاز القلب والأوعية الدموية.				
19. أنا مرهقه من ممارسة التمارين الرياضية.				
20. لقد تحسن شعوري بالرفاه والصحة من ممارسة التمارين الرياضية				
21. زوجي (أو أخرين مهمين لي) لا يشجعوني على ممارسة التمارين الرياضية				
22. ممارسة التمارين الرياضية تزيد قدرتي على التحمل.				

Benefits And Barriers To Physical Activity Among Saudi Females College Students
Maali Saud Alsahli

23. ممارسة التمارين الرياضية تحسن المرونة لدي.				
24. ممارسة التمارين الرياضية تستغرق وقتا طويلا جدا من العلاقات الأسرية.				
25. تم تحسين التصرف لدي بسبب ممارسة التمارين الرياضية				
26. ممارسة التمارين الرياضية تساعدني على النوم بشكل أفضل ليلا.				
27. سوف تعيش لفترة أطول إذا مارست التمارين الرياضية				
28. اعتقد ان الناس بملابس ممارسة التمارين الرياضية تبدو مضحكة.				
29. ممارسة التمارين الرياضية تساعدني على خفض التعب.				
30. ممارسة التمارين الرياضية وسيلة جيدة بالنسبة لي للقاء أشخاص جدد				
31. تم تحسين قدرتي البدنية على التحمل من خلال ممارسة التمارين الرياضية				
32. ممارسة التمارين الرياضية تحسن مفهوم الذات لدي.				
33. أفراد عائلتي لا يشجعونني على ممارسة التمارين الرياضية				
34. ممارسة التمارين الرياضية تزيد حالة اليقظة النفسية لدي.				
35. ممارسة التمارين الرياضية تتيح لي الفرصة لتنفيذ الأنشطة العادية دون أن أتعب.				
36. ممارسة التمارين الرياضية تحسن نوعية عملي.				
37. ممارسة التمارين الرياضية تستغرق وقتا طويلا جدا من المسؤوليات العائلية.				
38. ممارسة التمارين الرياضية هو ترفيه جيد بالنسبة لي.				
39. ممارسة التمارين الرياضية تزيد قبولي من قبل الآخرين.				
40. ممارسة التمارين الرياضية هو عمل صعب بالنسبة لي.				
41. ممارسة التمارين الرياضية تحسن أداء الجسم عموما بالنسبة لي.				
42. هناك أماكن قليلة جدا بالنسبة لي لممارسة التمارين الرياضية.				
43. ممارسة التمارين الرياضية تحسن مظهر جسدي.				

نهاية الاستبيان
شكرا لمشاركتك