Determinants of Physical Activity among Young Sedentary Adults

by

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Submitted in Partial Fulfillment of
The Requirements for the Master of Science in Exercise Science Degree

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STATE UNIVERSITY OF NEW YORK COLLEGE AT CORTLAND

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Abstract

The purpose of this study was to analyze various barriers to physical activity and to determine whether extrinsic barriers were more relevant than the intrinsic barriers among young sedentary adults. University students and residents from community (n = 77, age = 24.72 ± 7 years) participated in this study. All participants self disclosed that they were not active for no more than 20 minutes once a week. Using a Likert type scale, participants responded to an instrument with 21 items representing barriers to physical activity. The results showed that lack of will power (98.5%) was the most important barrier. Lack of time (94%), lack of energy (91%), and social influence (86%) were also some of the important barriers cited by the participants. It was concluded that intrinsic barriers were more important than extrinsic barriers to physical activity in young adults.
Preface and Acknowledgement

I would like to thank several people, without whom this project could not have been completed.

My thesis committee Dr. Phil Buckenmeyer, chair, Dr. Joy Hendrick, and Dr. Katherine Polasek for all of their help and support throughout this process.

I would thank all my subjects who volunteered to complete the questionnaire on-line, so I could collect the data.

I am very appreciative of everyone’s willingness to participate in this thesis study by contributing their time and helping me complete my study.
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Chapter 1
Introduction

Background

Physical activity is a complex dynamic process (Sherwood & Jeffery, 2000). The beneficial effect of physical activity on cardiovascular health is well-known. Regular physical activity improves myocardial function, maintains or increases myocardial oxygen supply, and increases the electrical stability of the myocardium (Fang et al., 2003). The perceived benefits to physical activity participation include both extrinsic and intrinsic reasons (Allison et al., 2005). Reichert, Barros, Domingues, and Hallal (2007) found that in spite of well-recognized benefits of physical activity, millions of people are physically inactive. Additionally, Sherwood and Jeffery (2000) suggested that in-spite of well-documented health benefits of physical activity t a majority of adult men and women are found to be in active. Hence, promoting regular physical activity is a public health priority.

According to the Canadian Fitness and Life Style Institute (CFLSI) (1995) barriers are different for active and inactive individuals. These barriers differ widely between genders and also between various populations. The perceived barriers to physical activity have been widely studied (Reichert et al., 2007). The perceived barriers to physical activity include both intrinsic or individual factors and extrinsic or environmental factors (Allison et al., 2005). It has been shown that the score of external barriers is significantly greater than internal barriers in Turkish students (Daskapan, Tuzun, & Levent, 2006). Amesty (2003) studied the various barriers to physical activity among Hispanic populations and found that place of residency was an important barrier to physical activity. Additionally, social support was also found as the strongest predictor of physical activity (Amesty, 2003). Allison et al. (2005) studied the barriers to physical activity
among male adolescents and found that both extrinsic intrinsic reasons engage individuals in physical activity. Studies have also been performed on Turkish students (Daskapan, Tuzun, & Levent, 2006) and the findings have shown that perceived extrinsic barriers are more important than the intrinsic barriers. Gal, Santos, and Barros (2005) conducted a study among a Portuguese urban population. The results of the study found that sedentarism is high during leisure time among both Portuguese men and women. Zunft et al. (1999) examined the perceived benefits and barriers to physical activity among a European population. The results of the study found that lack of time as an important barrier among the European population. Thus, previous studies have analyzed various extrinsic and intrinsic barriers in diverse populations. However, limited research has examined young male and female in the United States.

Statement of Purpose

The purpose of this study was to analyze various barriers to physical activity and to determine whether extrinsic barriers are more relevant than intrinsic barriers among young sedentary adults. The results of such a study could help in planning effective interventions.

Research Hypothesis

It was hypothesized that extrinsic factors will affect the behavior towards physical activity participation more significantly than intrinsic factors in a young adult population.

Operational Definitions

Barrier

“Barrier refers to the obstacles individuals face in undertaking, maintaining, or increasing physical activity” (Allison et al., 2005, p.155).
Extrinsic Barrier

Extrinsic barriers refer to all the factors external to the individual, which influences a person’s behavior to physical activity participation (Latham, 1999). Extrinsic barriers can also be called as external or environmental barriers (Allison et al., 2005).

Intrinsic Barrier

Intrinsic barriers refer to all the factors internal to the individual, which influences a person’s behavior to physical activity participation (Latham, 1999). Intrinsic barriers can also be called as internal or individual barriers (Allison et al., 2005).

Physical Activity

The Center for Disease Control (CDC) defines physical activity as “bodily movements produced by the contraction of skeletal muscle that increases the energy expenditure above the basal level” (CDC, 1999, p. 20).

Sedentary

Individuals who were active not more than one day in a week for not more than 20 minutes are considered sedentary.

Young Adult

Individuals between the ages of 18-40 years are considered as young adults.

Assumption

The researcher assumed the subjects honesty in providing informed consent and completing the on-line questionnaire.

Limitations

The study was limited to the following factors
1. Barriers were not assessed objectively, but through self-report (perceived barriers). Objective barriers may be perceived differently by different young adults. Hence, the perception of factors hindering their efforts to engage in physical activity cannot be determined objectively among young adults.

2. The study was also limited by the honesty that each participant answered the questionnaire.

**Delimitation**

The study was delimited to the following factors:

1. Young adults in a rural upstate NY
2. Sedentary population, and
3. The information found from seven categories listed in barriers to being active quiz questionnaire (Latham, 1999). Based on the barriers to being active quiz questionnaire categories two and seven are classified as extrinsic barriers.
4. Fall season of the year which can cause a difference in the response to physical activity questionnaire.

**Significance of the study**

To date, none of the previous studies have tried to analyze barriers among young sedentary populations. The results of this study could potentially give insight into the various barriers faced by young adults in their day to day life. Additionally, the findings of this study could shed light on the current or existing interventions to promote physical activity among young adults who are sedentary.
Chapter 2

Review of Literature

Introduction

Individuals move through specific phases of exercise participation that are determined by diverse factors (Sherwood & Jeffery, 2000). Individuals are engaged in physical activity for both intrinsic and extrinsic reasons, and their perceived barriers to physical activity, if any, include both internal factors and external factors (Allison et al., 2005). It is essential to identify factors related to physical activity at different stages in the life span in order to be able to develop effective interventions (Tammelin, Nayha, Laitinen, Rintamaki, & Jarvelin, 2003). Hence, the initial section of the study will be highlighting various recommendations to physical activity among various age groups followed by barriers experienced among adolescents, young adults and a senior population. The second section the study will discuss about the attitudes towards physical activity and food followed by an overview of barriers experienced during leisure time. In the third section the study will discuss the various perceived benefits and barriers to physical activity experienced among various populations. The third section the study will discuss the role of environment towards physical activity. In the final section of the study, common individual and environmental barriers to physical activity followed by the importance of promoting physical activity will be discussed.

Recommendations for Physical Activity

The Council on Sports Medicine and Fitness and Council on School Health (CSMFCSH) (2006) reported in a recent policy statement that the prevalence of pediatric obesity has reached epidemic proportions. Furthermore, it was suggested that it is unlikely that the medical profession alone will be able to solve this serious health problem. According to CSMFCSH,
there is insufficient evidence to recommend exercise programs or classes for infants and toddlers as a means of promoting increased physical activity or preventing obesity in later years. Conversely, the American Academy of Pediatrics (AAP) offered recommendations. The AAP recommended that children younger than two years of age should not watch television. They also suggested that parents should be encouraged to provide a safe, nurturing, and minimally structured play environment for their infant (CSMFCSH, 2006).

According to AAP recommendations for physical activity among the preschool-aged children (4–6 years), free play should be encouraged with an emphasis on fun, playfulness, exploration, and experimentation while being mindful of safety and proper supervision. Furthermore, preschoolers should also begin walking tolerable distances with family members and reduce sedentary transportation by car and stroller (CSMFCSH, 2006).

The AAP recommended that elementary school aged children (6–9 years) should aim to improve their motor skills, visual tracking, and balance. Parents should continue to encourage free play involving more sophisticated movement patterns. These children should also be encouraged to walk, dance, or jump rope, and may enjoy playing miniature golf (CSMFCSH, 2006).

The AAP recommended that middle school aged children (10–12 years), participate in physical activities that focus on enjoyment with family members and friends. There should be an emphasis on skill development and an increasing focus on tactics and strategy as well as factors promoting continued participation (CSMFCSH, 2006).

According to the AAP adolescents are highly social and often influenced easily by their peers. Thus, identifying activities that are of interest to the adolescent, especially those that are fun and include friends is crucial for long-term participation. According to AAP examples of
physical activities for adolescents, may include personal fitness preferences such as dance, yoga, and running; active transportation such as walking and cycling; household chores, and competitive and noncompetitive sports.

*Adolescence and Physical Activity*

A complex inter-relationship exists between the sedentary behaviors and physical inactivity among the adolescent populations (Koezuka et al., 2006). Koezuka et al. (2006) conducted a study to evaluate the relationship between the time spent on sedentary activities and physical inactivity in a sample of youth between the ages of 12-19 years. The results of the study found that 50.3% of males and 67.8% of females were inactive. Allison et al. (2005) conducted a study among adolescent males and found the common intrinsic and extrinsic reasons that engage individuals in physical activity. The most common intrinsic reasons to participate in physical activity were enjoyment, challenge, and skill development. The common extrinsic reasons to participate in physical activity were socialization, to maintain an attractive appearance, and to gain a good reputation (Allison et al., 2005). Pietilainen et al. (2008) conducted a study on an adolescent population. They found that a decline in physical activity and weight gain in adolescence is associated with abdominal obesity in adults. Thus, they concluded that poor physical fitness in adolescence increases the risk of overall and abdominal obesity in adulthood.

*Young Adults and Physical Activity*

There are certain benefits and barriers to physical activity among young people. Daskapan, Tuzun, & Eker, 2006). Daskapan, Tuzun, and Eker (2006) conducted a study to analyze perceived barriers to physical activity among Turkish young male and female university students. The study used a self administered questionnaire which consisted of 12 items. The 12 items on the questionnaire were rated on a 12 point Likert scale which helped to determine the
perceived benefits and barriers to physical activity. The most commonly cited physical activity barrier was lack of time due to study commitments and responsibilities related to family and social environment. They found that the perceived external barriers were more important than perceived internal barriers.

Sutjahjo, Ball, Warren, Inglis, and Crawford (2004) examined the relationship between a range of perceived personal, social, and environmental barriers to physical activity and healthy eating among women between the ages of 18-32 years. The participants completed the self-reported mail-in survey that included questions on 11 barriers to physical activity and 11 barriers to healthy eating. Additionally, self-reported height and weight values were also recorded and this information was used to calculate body mass index (BMI). The results of this study identified the most important perceived barriers to physical activity and healthy eating were related to lack of motivation, lack of time, and cost (Sutjahjo et al., 2004).

**Seniors and Physical Activity**

According to the Canadian Fitness and Lifestyle Research Institute (1996) the top ten barriers among the age group of 65 years and older are energy, motivation, illness or injury, fear of injury, skill, time, ill at ease, facilities, cost, and safe places. Hillsdon, Brunner, Guralnik, and Marmot (2005) mentioned that a key aspect of successful aging is maintaining physical function. Furthermore, they noted that physical activity earlier in the life course helps to preserve high physical function over an extended period of time, before the onset of major age-related declines in physical function. Belza, Walwick, Thornton, Schwartz, Taylor, and Logerfo (2004) mentioned that although the health benefits of physical activity are well-documented, older adults are less physically active than any other age group. They conducted a study to examine the barriers and facilitators to physical activity and exercise among, ethnically-diverse older adults.
They found that walking was the exercise of choice across all ethnic groups. Additionally, health served as a motivator as well as a barrier to physical activity. Other factors influencing physical activity were weather, transportation, and personal safety.

Morris, McAuley, and Motl (2008) suggested that the perceptions of one’s environment and functional status have been linked to physical activity in older adults. They examined the roles played by neighborhood satisfaction, functional limitation, self-efficacy, and physical activity in a sample of older women over a six month period. The results showed that neighborhood satisfaction and functional limitations have direct effects on residual changes of self-efficacy. Moreover the change in self-efficacy was associated with changes in physical activity at six months.

**Attitudes towards Physical Activity and Food**

Brug, Lechner, and Devries (1995) found that one of the possible causes of obesity could be the behavioral pattern which includes attitudes towards food and exercise. Craeynest, Crombez, Houwer, Deforche, and Bourdeaudhuij (2005) conducted a study to investigate the differences in personal explicit and implicit attitudes towards food and physical activities between overweight children and a lean control group. The implicit attitude was measured using the Extrinsic Affective Simon Task (EAST) and explicit attitudes were assessed by self-reports. They found that there were no differences between the two groups in the explicit attitude towards food and physical activity. However, children and adolescents with obesity had a more pronounced positive implicit attitude towards food in general.

In a follow up study by Craeynest et al. (2006) the researchers investigated whether the implicit self-concept is related to fat versus non-fat food, and exercising versus sedentariness in children with and without obesity. Additionally, self-reported attitudes towards physical activity
and food were assessed using a rating scale. According to their results, youngsters with and without obesity had similar explicit attitudes towards physical activity and food. Additionally, it was found that both the groups were neutral towards non fat food and mildly positive towards sedentariness, exercising, and fat food.

Craeynest, Crombez, Deforche, Tanghe, and Bourdeaudhuij (2007) investigated whether implicit and self-reported food and exercise attitudes changed during a residential six-month treatment period in youngsters with obesity. The results showed that the obese individuals lost weight during the treatment, which was not regained at follow-up. There was no change in self reported attitudes to food or exercise (Craeynest et al., 2007).

**Leisure time Physical Activity**

Amesty (2003) mentioned that leisure time physical activity and exercise are behaviors that are particularly complex to understand as they are highly influenced by a number of factors. Amesty (2003) conducted a study to analyze barriers to leisure-time physical activity in the Hispanic population in the United States (U.S). The results showed that the individual, along with the community, and place of residency were the two most important barriers to physical activity. Furthermore, it was found that individual and community variables included social support, literacy, poverty, acculturation, and perceptions of safety (Amesty, 2003). Haapanen et al. (2000) found that an increase in leisure time physical activity (LTPA) among thirty five to sixty three year old Finnish men and women seemed to have a beneficial effect on the mortality risk of obese and non obese women. Additionally, it seemed to have a similar effect on fit and unfit subjects.

Gal, Santos, and Barros (2005) conducted a study among Portuguese adults who were 18 years and older. The study tried to determine the extent to which the Portuguese urban
population was sedentary and the various factors that were associated with the Portuguese lifestyles. They found that sedentarism is high during leisure time in both genders. However, in a full day energy expenditure which includes physical activity at work, sleeping hours, and household chores it was found that 74% of the males and 86% of the females were found to be sedentary (Gal, Santos, & Barros, 2005). Wardle (2007) found that the energy intake and energy expenditure were affected by characteristics of food supply; the knowledge, attitudes, emotional state, and experiences of the individual; and the social and cultural context in which the behavior occurred. Thus, the consequences of these behaviors that occurred were influenced by a wide range of internal and external determinants (Wardle, 2007).

_perceived benefits and barriers_

Zunft et al. (1999) examined the perceived benefits and barriers to physical activity from all the European member states and found that the perceived benefits for people to participate in physical activity were to maintain good health, to release tension, and to get fit. The most important barrier to physical activity was lack of time due to work or study commitment and the subjects belief that they were not the sporty type. Daskapan, Tuzun, and Levent (2006) analyzed the barriers to physical activity among Turkish students. The perceived barriers were divided into two categories as internal and external barriers. Internal barriers were grouped into three sub-categories: lack of energy, lack of motivation, and lack of self efficacy. Also, external barriers were grouped into three categories: lack of resource, lack of social support, and lack of time. They concluded that the total score of the external barrier was significantly higher than the internal barrier. Lack of time was reported as the most important external barrier and lack of energy was the most important internal barrier (Daskapan, Tuzun, & Eker, 2006). There was a close interplay between individual and environmental factors. Social support was found to be the
strongest predictor of physical activity among the Hispanic community (Amesty, 2003). Salmon, Owen, Crawford, Bauman, and Sallis (2003) suggested that future research should try to examine individual and environmental influences on physical activity and sedentary behaviors.

**Role of Environment in Physical Activity**

Applications of health behavior theories to physical activity have identified the role of environmental influences most often in terms of barriers (Humpel, Owen, & Leslie, 2002). McCormack et al. (2004) mentioned that environment has the potential to influence the physical behaviors; hence creating supportive environments has the potential to increase physical activity. Furthermore, McCormack and colleagues (2004) suggested that both perceived and objectively-measured physical environmental attributes appear to be associated with physical activity.

Humpel, Owen, and Leslie (2002) examined the association between physical environmental factors such as accessibility of facilities, opportunities for activity, weather, safety, and aesthetic conditions to physical activity behavior. They found that accessibility, opportunities, and aesthetic attributes have significant associations with physical activity whereas, weather and safety showed less strong relationships with physical activity. They suggested that future research be conducted in-order to identify possible causal relationships (Humpel, Owen, & Leslie, 2002). The Canadian Fitness and Lifestyle Research Institute (CFLRI) (1996) investigated barriers to physical activity. Barriers were classified as major, moderate, or minor. Both individual and environmental barriers were shown to affect physical activity. Lack of time, lack of energy, and lack of motivation were the major barriers to maintaining physical activity (CFLRI, 1996).
Individual Barriers

According to the CFLRI (1996), excessive cost, illness or injury, feeling uncomfortable, lack of skill, and fear of injury are some of the moderate barriers to physical activity. As reported earlier, Daskapan, Tuzun, and Eker (2006) found that lack of time and lack of energy were the most important barriers to physical activity among the university Turkish students. Furthermore, it was found 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 among the university students (Daskapan, Tuzun, & Eker, 2006). Zunft et al. (1999) found that work or study commitments was the most frequently cited barrier for not increasing participation in physical activity. Sutjahjo et al. (2004) conducted a study that found the most commonly perceived barriers to physical activity among young women were lack of motivation, lack of time, excessive cost, and lack of skill. Whitehead (1993) mentioned that motivation was one of the key elements in promoting healthy life-styles.

Children are born intrinsically motivated to be physically active. That motivation if kept alive by physical success, freedom, and fun – will do more than promote the fitness behaviors that add years to life. It will maintain the physical zest that adds life to the years (Whitehead, 1993).

Learning fitness knowledge and skills can also promote activity in the future (Whitehead, 1990). Allison et al. (2005) found that the cost of facilities was one of the perceived barriers to physical activity among male adolescents. Zunft et al. (1999) mentioned that fear of injury can be a barrier, however, it was cited by less than 10% of the European population.

Environmental Barriers

According to the CFLRI (1996), the lack of safe places, lack of child care, lack of partner, insufficient programs, lack of support, and lack of transportation were some of the minor environmental barriers to physical activity. Safety concerns have been studied extensively and a
A relationship has been found between area of residence and fear of crime among Hispanics (Amesty, 2003). Amesty (2003) noted that large numbers of Hispanics are poor and tend to live in poor neighborhoods. The results of the study found that one of the major barriers for Hispanics to remain physically active was place of residency. Additionally, social support was also found as the strongest predictor of physical activity (Amesty, 2003). Sutjahjo et al. (2004) conducted a study among young women and found that women with children reported lack of social support as an important barrier to physical activity. Additionally, some of the less commonly reported barriers included lack of partner or friends, lack of information, lack of children support, and inaccessibility. Allison et al. (2005) found that inaccessibility was one of the most important external barriers to physical activity among adolescent males. Furthermore, cost, lack of facilities, and programs were cited as some of the structural determinants to physical inactivity among adolescent males (Allison et al., 2005).

Promoting Physical Activity

Latham (1999) considered promoting physical activity as a guide to improving life-style among the community. She explained the various foundations for physical activity, strategies for changing physical activity behavior, strategies for planning and implementing a new intervention, and various resources for action. Furthermore, Latham suggested that the key to success is to equip people with the knowledge and skills, to practice those new skills, to provide a supportive environment, and to address some of the biggest physical or political barriers that prevent people from being physically active (Latham, 1999).

Summary

Barriers to physical activity have been extensively studied among some age groups and populations. Research has shown that an increase in leisure time physical activity decreases the
mortality risk among fit and un-fit individuals. The energy intake and energy expenditure are consequences that are influenced by a wide range of internal and external determinants. Thus, there needs to be a promotion of decreased caloric intake and increased energy expenditure within all aspects of society.

Most studies have identified the role of environmental (extrinsic) and individual (intrinsic) factors on physical activity and sedentary behaviors. As per procedures used in previous research, it has been found that the extrinsic score has been more beneficial than the intrinsic score. Thus, extrinsic factors are more commonly cited as a barrier to physical activity than intrinsic factors. There is a limited research among the young adult population. Studies on young adult populations have examined perceived barriers among young women and Turkish University students. However, the perceived barriers faced by young women are likely to differ from those faced by young males. Hence, future research should try to examine the perceived barriers to physical activity among both young males and females.
Chapter 3

Methods

Subjects

Four hundred and seventy-seven adults participated in this study. Out of the respondents data from only 74 young adults were used in this study. The data sampling was performed on the basis of their age and physical activity levels. Data from participants who reported themselves between the ages of 18 to 40 years were only used in the study. Further, data from the participants who reported themselves as being active for may be one day in a week for only 20 minutes or the ones who reported themselves as being not active on any of the days in a week for at least 20 minutes were used. Each participant was informed of the risks associated with study and approved an on-line consent form before participating in survey. The study protocol was approved by SUNY Cortland Institutional Review Board (See Appendix A). The details of the informed consent form are included in the Appendix B.

Instruments

The “Barriers to being Active Quiz” questionnaire was used in this study (Latham, 1999). This questionnaire was developed and used by the Bloomington Heart Health Program, which is a local health department in Minnesota. The study was conducted in the 1980’s, a decade when Minnesota was participating in the National Heart, Lung, and Blood Institute's Heart Health Intervention Program. Minneapolis (Minnesota), Stanford (California), and Pawtucket (Rhode Island) were the three locations funded for this 10-year intervention study. There have been numerous journal publications resulting from this landmark study (Latham, 1999). In addition, the study also required the participants to self-report their height and weight and this information
was used to calculate their Body Mass Index (BMI = weight in kg/height in m$^2$). Self-reported height and weight have been shown to provide reasonable valid measures of actual height and weight for the purpose of investigating relationships in epidemiological studies (Sutjahjo et al., 2004).

**Procedures**

The study design was descriptive in nature and involved the use of a closed-ended questionnaire (see Appendix C). The questionnaire was administered on-line using a secure on-line survey website. The participation in the survey was anonymous and voluntary. All young adults were 18 and above and were solicited via campus e-mail to participate in the study. The participants who chose to participate were asked to complete the two sections of the survey. Participants who were not comfortable in answering a particular question were free to skip that question and proceed with the survey.

In the first section, the participants were requested to provide information regarding, demographics (e.g., age, sex, height, weight, marital status, children, ethnicity) and information regarding the levels of physical activity participation. Following this, all the participants were asked to complete the questionnaire regarding “Barriers to Being Active” The questionnaire consisted of 21 closed-ended questions that aimed at finding the reasons why people do not get as much physical activity as they think they should (Latham, 1999).

**Measurements**

All questions on the questionnaire were scored on a 4-point Likert scale that ranged from “very likely” (3) to “very unlikely” (0). Some of the questions were related to lack of time, such as “My day is so busy now; I just don’t think I can make the time to include physical activity in my regular schedule”; “Physical activity takes too much time away from other
commitments – time, work, family, etc”; and, “My free times during the day are too short to include exercise”. Some questions were related to lack of energy to perform a physical activity, such as “I am just too tired after work to get any exercise”; “I don’t get enough sleep as it is. I just couldn’t get up early or stay up late to get some exercise”; and “I am too tired during the week and I need the weekend to catch up on my rest”.

Similarly questions related to social influences, such as lack of will power, fear of injury, lack of skill, and lack of resources were also included in this questionnaire (refer to Appendix C).

Calculations

Three questions related to each category were asked in the questionnaire. Participants were instructed to circle on-line the in the appropriate spaces provided, by putting the number for statement 1 on line 1, statement 2 on line 2 and so on. A total score was calculated by adding the three scores on each line. The barriers to physical activity was found to be present under one or more of the seven categories, as follows: (1) Lack of time, (2) Social influences, (3) Lack of energy, (4) Lack of will power, (5) Fear of injury, (6) Lack of skill, and, (7) Lack of resources. The extrinsic barriers were the ones that were found under the second and seventh category while the remaining ones were considered as intrinsic barriers. A score of 5 or above in any of the seven categories, indicated that particular category as an important barrier for the subject to overcome. The self-reported heights and weights were used to calculate the Body Mass Index by using the formula; BMI= weight in kg/height in m² based on the guidelines suggested by American College of Sports Medicine criteria (Whaley, 2006).

Statistical Analysis

The data analysis was performed using SPSS version 16.0 for windows. An alpha level of .05 was used for all the tests. The dependent variable included the barrier score total and the
The independent variable was each barrier. A frequency distribution test was used to determine each of the total barrier scores. One-way within subjects analysis of variance (ANOVA) was performed to compare the means of barriers scores among all the seven categories. If the Mauchly’s test of sphericity were found significant then the results of a Greenhouse-Geisser correction were made. A chi-square was performed to determine if there is any association between the barrier score and the BMI category level. Microsoft Excel was used to produce graphs.
Chapter 4

Results and Discussion

Results

Subject Characteristics The physical and the demographic characteristics of the subjects were determined using descriptive statistics in SPSS for windows (Version 16) (see Table 1)

Table 1

Physical and Demographic Characteristics of Subjects*

<table>
<thead>
<tr>
<th></th>
<th>Males (n)</th>
<th>Females (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>10</td>
<td>64</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single (n)</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Married (n)</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Cohabitating but unmarried (n)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian (n)</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>White (n)</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Hispanics (n)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Asian (n)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>African American (n)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Italian (n)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Others (n)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With (n)</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Without (n)</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>BMI Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Mean BMI (kg/m^2)</td>
<td>26.21 + 6.286</td>
<td></td>
</tr>
<tr>
<td>Mean Age (yrs)</td>
<td>24.7 + 7.008</td>
<td></td>
</tr>
</tbody>
</table>

*n = 74
Perceived Barriers

Frequency distributions of the total barrier scores in each of the seven barrier categories were generated and helped to determine the observed and the expected frequencies of the total barrier score in each of the seven categories. A listing of the number of respondents indicating the barrier as important (with barrier scores of 5 or higher) appears in Table 2. A significant chi-square goodness of fit test was calculated, $X^2 (5, N = 274) = 96.774, p < .0005$, indicating a difference between the distribution and an expected distribution across barriers. As observed in table 2, lack of skill, fear of injury, and lack of resources were identified by fewer people as important compared to the other barriers. This inequity was present for both the intrinsic and extrinsic barrier groups.

Table 2

*Total Subjects and Number of Subjects Subjectively Rating Each Category as an Important*

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Total (N)</th>
<th>Observed (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrinsic Barriers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Willpower</td>
<td>68</td>
<td>67</td>
</tr>
<tr>
<td>Lack of Time</td>
<td>71</td>
<td>67</td>
</tr>
<tr>
<td>Lack of Energy</td>
<td>70</td>
<td>66</td>
</tr>
<tr>
<td>Lack of Skill</td>
<td>68</td>
<td>9</td>
</tr>
<tr>
<td>Fear of Injury</td>
<td>68</td>
<td>0</td>
</tr>
<tr>
<td><strong>Extrinsic Barriers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Influence</td>
<td>71</td>
<td>59</td>
</tr>
<tr>
<td>Lack of Resources</td>
<td>67</td>
<td>6</td>
</tr>
</tbody>
</table>

*Barrier totals with scores of 5 or higher are categorized as important*
The percentage response to both extrinsic and intrinsic barriers was then calculated. The results showed that the most important extrinsic barrier cited was social influences (83%). Only 9% of the total participants who responded cited lack of resources as an important extrinsic barrier. The most important intrinsic barriers cited by the respondents were lack of will power (98.5%), lack of time (94%), and lack of energy (94%). Only 13% of the respondents reported lack of skill as an important intrinsic barrier and there were no participants who experienced lack of injury as an important intrinsic barrier. By examining the frequency distribution for each of the total barriers score totals, the results of were summarized (see Table 3).

Table 3

Percentage Response to Extrinsic and Intrinsic Barriers

<table>
<thead>
<tr>
<th>Barrier Category</th>
<th>Important Barrier</th>
<th>Not Important Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extrinsic Barriers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Influence</td>
<td>83%</td>
<td>17%</td>
</tr>
<tr>
<td>Lack of Resources</td>
<td>9%</td>
<td>91%</td>
</tr>
<tr>
<td><strong>Intrinsic Barriers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of willpower</td>
<td>98.5%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Lack of Time</td>
<td>94%</td>
<td>6%</td>
</tr>
<tr>
<td>Lack of Energy</td>
<td>94%</td>
<td>6%</td>
</tr>
<tr>
<td>Lack of Skill</td>
<td>13%</td>
<td>87%</td>
</tr>
<tr>
<td>Fear of Injury</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>
A one-way, within subjects, ANOVA was performed to compare the means of barriers scores among all the seven categories. The Mauchly’s test of sphericity was found to be significant. Greenhouse-Geisser correction was made. There was a significant effect of the barriers to physical activity towards the physical activity participation, $F(6,390) = 210.667, p < .0005, n^2 = .764$. Further, it was found that the means of all the barriers were significant ($p < 0.05$), except for lack of energy which did not show any significant differences in its means ($M = 6.167$). The graphical representation of all the means show that overall the intrinsic barriers are more commonly cited as an important barrier than the extrinsic barriers (see Figure 1 and Figure 2).

![Graph showing comparison between means of extrinsic barriers for social influence and lack of resources](image)

*Figure 1.* Comparison between the means ($M$) of extrinsic barriers for social influence ($M = 5.08$) and lack of resources ($M = 1.85$). *Note.* Rating is derived through adding Means of Questions: $2 + 9 + 16$, and $7 + 14 + 21$. 
Figure 2. Comparisons between the means of intrinsic barriers, for lack of willpower (\(M = 6.96\)), lack of energy (\(M = 6.19\)), lack of time (\(M = 6.08\)), and lack of skill (\(M = 1.85\)). Note. Rating is derived through adding the Means of Questions: 1 + 8 + 15; 3 + 10 + 17; 4 + 11 + 18; 5 + 12 + 19; and 6 + 13 + 20.

**Body Mass Index**

A multi-dimensional chi-square with a crosstabs was performed to determine if there was an association between each of the seven barriers and the four BMI category levels. The results of the test showed that there was no relationship between the BMI levels and the barriers to physical activity (\(p > .05\)) (see Table 4). The percentage distribution of the number of young adults who fall in each of the four BMI category levels is summarized (see Figure 3). The population breakdown for this sample is similar to the percentages for national averages as noted by Center for Disease Control (CDC) (2002).
Figure 3. Percent (%) distribution of participants for all BMI categories

Table 4

Association between Body Mass Index and Barriers to physical activity*

<table>
<thead>
<tr>
<th>Barrier Category</th>
<th>Chi- square ($X^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of Willpower</td>
<td>.883</td>
</tr>
<tr>
<td>Lack of Time</td>
<td>.309</td>
</tr>
<tr>
<td>Lack of Energy</td>
<td>.925</td>
</tr>
<tr>
<td>Lack of Skill</td>
<td>.182</td>
</tr>
<tr>
<td>Fear of Injury</td>
<td>.614</td>
</tr>
<tr>
<td>Social Influences</td>
<td>.955</td>
</tr>
<tr>
<td>Lack of Resources</td>
<td>.667</td>
</tr>
</tbody>
</table>

*p > .05
Discussion

Regular physical activity improves psychological health and cardio respiratory fitness (Fang et al., 2003). It was shown how physical activity patterns are established in childhood, adolescence, and young adulthood (Buckworth, 2001). The present study assessed the perceived important barriers to physical activity among college students and community people. Lack of willpower was the most important barrier for not participating in physical activity among the sample population used in this study. This finding is not in accordance with previous studies. Further, the study reported lack of time, social influence, and lack of energy as the most common barriers cited among the young adults. These findings were in accordance with the previous studies (Daskapan, Tuzun, & Levent, 2006; Zunft et al., 1999; Sutjahjo, Ball, Warren, Inglis, & Crawford 2004).

When viewing the answers to the physical activity questionnaire, four items which had higher rates were, “I have been thinking about getting more exercise, but I just can’t seem to get started”, “My day is so busy now, I just don’t think I can make the time to include physical activity in my regular schedule”, “I am just too tired after work to get any exercise”, and “I want to get more exercise, but I just can’t seem to make myself stick to anything”. Additionally the study found that lack of skill and lack of resources did not have any special significance. In this survey, perceived internal barriers seemed to be more important than perceived internal barriers. The items related to perceived external barriers have low rates when compared to the internal barriers. Only one item which indicated social influence, an extrinsic barrier reached a significant level. Studies found that perceived internal barriers were inversely related to participation in physical activity among high school students (Allison et al., 1999). Allison et al. (2005) found that perceived internal barriers were as important as perceived external barriers in
young people. An analysis of the research literature showed that the differences between the current study and related studies were not unexpected.

Limitation of Research

One limitation of the present study was that the study was limited to the information found from the seven categories listed in the Barriers to Being Active Quiz questionnaire (Latham, 1999). Based on the categories, only one and seven are classified as extrinsic barriers. Another limitation of the present study which must be considered was that the research was carried out within one particular college campus and community. Hence, the participation was limited to the members of the community. Socio cultural and economic profiles of the students who participated to this study may be different from the students who attended other universities in the adjoining central New York area. This could be one of the possible reasons that can have an affect on the profile of the barriers. If this study involved varied students in other undergraduate programs, faculties, and universities perhaps different internal or external perceived barriers to physical activity would be important. Lastly, the study focused only on the young sedentary population perceptions towards barriers to physical activity. People who belong to other age groups may also face barriers to physical activity in their day to day life.

Summary

Thus, the findings of the study will help on the current or existing interventions to promote physical activity among young adults who are sedentary. The written questionnaire used in this study was brief and focused on “need to know” questions that could be answered easily. The full respondent rate was observed in the questionnaire. It helped to achieve the aim of the study which was analyzing the barriers to physical activity among sedentary young adult
population. Thus, the study brought out reasons related to physical inactivity among the young who were sedentary for the first time.
Chapter 5
Summary, Conclusions, and Recommendations

Summary

The purpose of this study was to analyze various barriers to physical activity and to determine whether extrinsic barriers are more relevant than intrinsic barriers among young sedentary adults. There have been no studies that have tried to examine barriers among the sedentary young adult population. It was the intent of the present study to contribute knowledge in this particular sample population and to the existing research. Seventy four participants volunteered to participate in this study. The study consisted of administering Barriers to being Active questionnaire on-line through secure SUNY Cortland website. The survey was anonymous and voluntary. In the first section of the questionnaire the subjects background information and demographic details were recorded. Additionally, the subjects current physical activity level was based on a combination of International Physical Activity Questionnaire (IPAQ) guidelines and ACSM guidelines on physical activity. The subjects who performed physical activity for 3, 4, or 5, days a week for at least 20 minutes were considered active. The remaining subjects were considered as sedentary. In the second section the subjects were requested to complete Barriers to Being Active Quiz questionnaire. The questionnaire had 21 items. These items were rated on a 4-point Likert-type scale. The data analysis was performed using SPPS for Windows (Version 16). The results of the study showed that lack of will power (98.5%) was the most important intrinsic barrier and social influence (83%) was the most important extrinsic barrier. Further, lack of time and lack of energy (94%) both were cited as an important intrinsic barrier. Thus, overall the score of intrinsic barriers were greater than extrinsic barriers. This finding corresponded Allison, Dwyer, and Makin (1999) who found that perceived
internal barriers were inversely related to participation in physical activity among high school students. There was a significant effect of barriers towards physical activity participation ($p < .05$). There was no association between BMI and barrier to physical activity participation ($p > .05$).

**Conclusions**

Based upon the statistical analysis of the data, the following conclusions were made:

1. The study concluded that intrinsic barriers are more relevant when compared to extrinsic barriers among young sedentary adults, not supporting the research hypothesis.
2. There was no association found between BMI and barriers to physical activity participation.

**Recommendations**

Based upon the conclusions reached in this study, future research could benefit by following these recommendations:

1. The present study establishes a base of information that can be used for comparison in future studies. In attempting to analyze the most important barriers to physical activity, it was found the lack of will power was the most important barrier. This finding was not in accordance with the previous studies. However, it was found that lack of confidence was an important barrier towards physical activity among male adolescent population (Allison et al., 2005). Hence, future research should try to examine if there is a close relationship between lack of will power and lack of confidence as a barrier to physical activity.
2. Additionally, second implication of the study pointed out to the desirability of involving the adjoining universities in the central New York area involving larger
sample groups to develop a national standardized instrument. This information would be value in accurately identifying the perceived barriers and then recommend changes to enhance physical activity among young people.

3. The present study shows that the intrinsic barrier score is more than that of the extrinsic barriers. Previous studies have suggested that score of extrinsic barriers are more than that of intrinsic barriers (Allison et al., 2005; Daskapan, Tuzun, & Levent, 2006). Future research should try examining whether extrinsic barriers are more important than intrinsic barriers and vice versa by incorporating a larger sample size and various age groups.

4. Since the results of the study differ from the previous research, it is important to examine barrier in a given community before establishing physical activity intervention program as they vary depending on the location and the population.

5. The present study had subjects who were predominantly females. Hence, future research should try to incorporate a more balanced gender population.

6. Lastly, this study did not consider changing weather condition as a barrier to physical activity. Future research should consider weather conditions as a barrier and try to examine if bad weather has any impact on an individuals will-power.
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Human Kinetics

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MEMORANDUM

To: Suchitra Menon
From: Leslie Eaton, Associate Professor of Psychology
Institutional Review Board Administrator
Date: 8/25/2008
RE: Institutional Review Board Approval

In accordance with SUNY Cortland’s procedures for human research participant protections, the protocol referenced below has been approved for a period of one year:

Title of the study: Circumstances associated with time spent engaging in physical activity
Level of review: Exempt
Protocol number: 08/09-53
Project start date: Upon IRB approval
Approval expiration date: 12-31-08
Notes: Title of the study indicates the title used in consent documents.
* For information about continuation policies and procedures, visit http://www.cortland.edu/irb/Applications/continuations.html

The Federal Office for Research Protections (OHRP) emphasizes that investigators play a crucial role in protecting the rights and welfare of human subjects and are responsible for carrying out sound ethical research consistent with research plans approved by an IRB. Along with meeting the specific requirements of a particular research study, investigators are responsible for ongoing requirements in the conduct of approved research that include, in summary:

- obtaining and documenting informed consent from the participants and/or from a legally authorized representative prior to the individual’s participation in the research, unless these requirements have been waived by the IRB;
- obtaining prior approval from the IRB for any modifications of (or additions to) the previously approved research; this includes modifications to advertisements and other recruitment materials, changes to the informed consent or child assent, the study design and procedures, addition of research staff or student assistants, etc. (except those alterations necessary to eliminate apparent immediate hazards to subjects, which are then to be reported by email to irb@cortland.edu within three days);
- providing to the IRB prompt reports of any unanticipated problems involving risks to subjects or others;
- applying for continuation requests, consistent with SUNY Cortland Policies and Procedures and federal guidelines, prior to the expiration of this approval; and,
- maintaining records as required by the HHS regulations and NYS State law, for at least three years after completion of the study.

Given the topics and methods of research conducted at SUNY Cortland, investigators frequently possess multiple and possibly conflicting responsibilities to the scientific discipline, the IRB, the College, students, obligations to the greater Cortland community, research participants, and funding agencies/sponsors. A principle investigators ultimate duty is to ensure the protection of research participants during recruitment, participation, and after the study has concluded. In the event that questions or concerns arise about multiple roles or the conduct of research at SUNY Cortland, contact the IRB by email irb@cortland.edu or by telephone at (607)753-2079. You may also contact a member of the IRB who possesses expertise in your discipline or methodology, visit http://www.cortland.edu/irb/members.html to obtain a current list of IRB members. If you have any questions, please contact me.

Leslie Eaton

For more information about SUNY Cortland’s Human Participant Protection Program, visit us on the web: http://www.cortland.edu/irb

Old Main, Room 134-B • P.O. Box 1000 • Cortland, NY 13045
Phone: (607) 753-2079 • Fax: (607) 753-9437 • email: irb@cortland.edu
Appendix B

Informed Consent

State University of New York College at Cortland

This study you have been asked to participate in is being conducted by Suchitra Menon, through the Department of Kinesiology at SUNY Cortland.

Purpose and Explanation of the Survey
The purpose of the study is to determine the various barriers to physical activity faced among young adult population. The information obtained from this 5-minute anonymous survey is expected to contribute to knowledge in the field of Kinesiology and may be used when developing future extracurricular opportunities for students. SUNY Cortland students, faculty, and staff 18 years or older, are invited to participate in thesis research investigating circumstances associated with time spent engaging in physical activity.

Risks and Discomforts
The reasonably foreseeable risks or discomforts associated with this study are fewer than risks or discomforts normally encountered in daily life.

Confidentiality
To ensure the privacy and confidentiality of your responses, this anonymous survey and your data are housed separately on a secure, SUNY Cortland server. This is to make sure that no information is extracted from the computer you use for any reason (e.g., the research, for marketing, or for sale to other organizations—“third parties”). You can help to protect your privacy and the confidentiality of your information. To maintain your anonymity, in your survey responses, do not type your name or any other information that might reveal your identity. To protect your privacy, complete the survey in a location where you will not be interrupted. Use a computer with a wired internet connection (e.g., DSL) or a secured wireless connection (e.g., encrypted). If you have any doubt about the security of your internet connection for your private computer, use a computer on campus in a location where others cannot view your information (e.g., the last row of a computer lab, in the corner of the room). Finally, close completely out of your internet browser window when your participation has concluded. I have read the description of the project, and hereby consent to participate in the study.

Freedom to Withdraw
Your participation is voluntary; refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation (withdraw) at any time without penalty or loss of benefits to which you are otherwise entitled. In other words, choosing to participate, refusal to participate, or withdrawal from the study will never influence your present or future standing at SUNY Cortland or in the community.

Inquiries
For answers to pertinent questions about the research, you may contact:
Researcher: Suchitra Menon Master’s Candidate SUNY Cortland
Phone: (201) 218 -2511, email:Menon94@cortland.edu

Faculty Sponsor: Philip Buckenmeyer Associate Professor of Kinesiology Studio West,
   Room 138 Phone: (607) 753-5558
   Phil.Buckenmeyer@cortland.edu.

For answers to questions about SUNY Cortland research and research subjects' rights contact:
Dr. Leslie Eaton
IRB Administrator and Associate Professor of Psychology,
(607) 753-2079, irb@cortland.edu
By accessing the survey, you are agreeing that you understand the information in this Informed
Consent document. You can obtain the survey by copying the link into a new browser link:
## Appendix C

### Barriers to Being Active Quiz. What keeps you from being more active?

<table>
<thead>
<tr>
<th>How likely are you to say?</th>
<th>Very likely</th>
<th>Somewhat likely</th>
<th>Somewhat unlikely</th>
<th>Very unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.  My day is so busy now, I just don’t think I can make the time to include physical activity in my regular schedule.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2.  None of my family members or friends like to do anything active, so I don’t have a chance to be physically active.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3.  I’m just too tired after school/work to be active.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4.  I’ve been thinking about becoming more physically active, but I just can’t seem to get started</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5.  Participating in physical activities can be risky.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6.  I don’t get enough exercise because I have never learned the skills for any one sport.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7.  I don’t have access to jogging, trails, swimming pools, bike paths, etc.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8.  Physical activity takes too much time away from other commitments like work, family etc.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9.  I’m embarrassed about how I will look when I participate in physical activity with others.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>10. I don’t get enough sleep as it is. I just couldn’t get up early or stay up late to be physically active.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>11. It’s easier for me to find excuses not to be physically active than to go out and do something.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>12. I know of too many people who have hurt themselves by overdoing when they are physically active.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>13. I really can’t see learning a new sport.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>14. It’s just too expensive. You have to take a class or join a club or buy the right equipment.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>15. My free times during the day are too short to include physical activity.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>How likely are you to say?</td>
<td>Very likely</td>
<td>Somewhat likely</td>
<td>Somewhat unlikely</td>
<td>Very unlikely</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-----------------</td>
<td>-------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>16. My usual social activities with family or friends do not include physical activity.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>17. I’m too tired during the week and I need the weekend to catch up on my rest.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How likely are you to say?</th>
<th>Very likely</th>
<th>Somewhat likely</th>
<th>Somewhat unlikely</th>
<th>Very unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. I want to be more physically active, but I just can’t seem to make myself stick to anything.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>19. I’m afraid I might injure myself.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>20. I’m not good enough at any physical activity to make it fun.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>21. If we had exercise facilities and showers at work/school, then I would be more likely to be physically active.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Follow these instructions to score yourself:

1. Enter the circled number in the spaces provided, putting together the number for statement 1 on line 1, statement 2 on line 2, and so on.

2. Add the three scores on each line. Your barriers to physical activity fall into one or more of seven categories: lack of time, social influences, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources.

A score of 5 or above in any category shows that this is an important barrier for you to overcome.

\[
\begin{array}{ccc}
1 & 8 & 15 \\
\end{array} \quad \text{Lack of time}
\]

\[
\begin{array}{ccc}
2 & 9 & 16 \\
\end{array} \quad \text{Social influence}
\]

\[
\begin{array}{ccc}
3 & 10 & 17 \\
\end{array} \quad \text{Lack of energy}
\]
+ + = _______ Lack of willpower

+ + = _______ Fear of injury

+ + = _______ Lack of skill

+ + = _______ Lack of resources