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Increasing Daily Exercise Adherence in Women by Examining Motivational Factors

Victoria Wozniak
Walden University

Walden University

College of Social and Behavioral Sciences

This is to certify that the doctoral dissertation by

Victoria Wozniak, M.S.

has been found to be complete and satisfactory in all respects,
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Review Committee
Dr. Kathryn Dardeck, Committee Chairperson, Psychology Faculty
Dr. Craig Marker, Committee Member, Psychology Faculty
Dr. Carolyn Davis, University Reviewer, Psychology Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

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Abstract

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Proposal Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Women ages 20–39 years old have seen the most dramatic increase in obesity levels in the United States over the last 2 decades. Researchers have indicated the need for studies to increase motivation in women to promote daily exercise. There is a gap in the literature about what motivational factors are most effective with increasing exercise in daily life. Using the transtheoretical model of change (TM) as the grounding theory, this study measured daily exercise adherence. A selective sampling of women ages 20–39 years old in the United States were recruited to complete an online survey. The online survey included two sections: one to screen participants with informed consent, and the survey itself, including 4 original questions to obtain further information about type of exercise, access to social support, readiness for change, and exercise adherence. A full version of the Exercise Motivations Inventory–2 (EMI-2) was also administered to determine exercise motivation. In total, 105 women were surveyed in the full study and multiple regression was used to assess the findings. Results of the study confirm prior research findings that women engage in exercise due to positive health, ill-health avoidance, and to control weight. In addition, women in the present study indicated positive social support affects daily exercise adherence. The results of this study may contribute to positive social change by furthering our understanding of what contributes to exercise adherence in the United States.

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Dedication

This dissertation is dedicated to my son, Skyler. He has taught me so much about being a mother as well as being a better person. He has been the most influential person in my life and always will be. I strive every single day to make him proud of me. This dissertation and doctorate are my crowning professional achievements, but Skyler will always be my biggest life achievement.

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Chapter 1: Overview

Introduction

The purpose of this quantitative study was to examine whether type of exercise (i.e., anaerobic vs. aerobic exercise), access to social support, and readiness for change may lead to increased motivational factors in women of the United States, ages 20–39 years old. The results may contribute to decreasing the epidemic of obesity in the United States (Centers for Disease Control and Prevention [CDC], 2013; Division of Health Promotion, 2015), which stems largely from poor diet and limited exercise (CDC, 2013; Guthman, 2013). Chapter 1 includes an overview of the study and includes the following sections: background, problem statement, purpose, research questions and hypotheses, theoretical framework, nature of the study, definitions, assumptions, scope and delimitations, limitations, significance, and summary.

Background

The transtheoretical model of change (TM) has been used predominately to study populations suffering from substance abuse, eating disorders, and juvenile delinquency (Byom & Sapp, 2013; Dinger, Heesch, Cipriani, & Qualls, 2007; Findorff, Stock, Gross, & Wyman, 2007; Johnson et al., 2008; Yang, et al., 2015). Given the limited research with TM and incorporating exercise into daily lifestyle (Byom & Sapp, 2013; Dinger et al., 2007; Findorff et al., 2007; Johnson et al., 2008; Yang, et al., 2015), further research is needed on increasing motivational factors to create behavioral change (Iso-Ahola & Miller, 2016; Rackow, Scholz, & Hornung, 2013; Stevens & Bryan, 2015). My goal for this study was to address the gap in the scholarly literature

and improve understanding of motivational factors in women ages 20–39 years old that lead them to incorporate exercise into their daily lives.

Problem Statement

Researchers have found that exercise is beneficial to increasing overall health (Guthman, 2013; Stoltz, Reysen, Wolff, & Kern, 2009; King, 2013). Exercise is defined as using isolated or multiple muscle groups to expend energy (Kravitz & Vella, 2015). Nearly 400,000 deaths occurred in the United States in 2000 as a result of poor diet and limited amounts of exercise (Guthman, 2013), and approximately 100,000 of these deaths were women (Division of Health Promotion, 2015). Approximately 25% of female deaths per year in the United States are attributed to being overweight and its associated negative factors (CDC, 2013). As of 2012, 37% of women in the United States were considered obese (Yang & Colditz, 2015). In a study of 20 years of data, Shields, Carroll, and Ogden (2011) found that the "young women" group (women ages 20–39 years old) saw the most dramatic increase in obesity levels in the United States, increasing 13.3% over time. In light of these alarming findings, this dissertation is focused on the ages 20–39 years old, female population.

Kilpatrick (2005) suggested the need for more research on the motivating factors that lead to incorporating exercise into daily life. Motivational interviewing (Magill et al., 2014) is a client-centered therapy technique that elicits behavioral change by providing a safe environment for clients to discuss both reasons for and against change of behavior. Prochaska and DiClemente (1983) used motivational interviewing to determine motivational factors for implementing the stages of change. Limited research has been

done to determine what motivating factors are most influential in the decision to create lifestyle change and make those changes permanently incorporated into daily life (Cross, 2013; Stoltz et al., 2009). Motivational interviewing may serve as one useful way to focus research on what helps women decide to stick with an exercise plan. In this qualitative study, I examined the correlation between readiness for change, motivational factors for change, as well as regular exercise in relation to decreasing obesity levels among women in the United States ages 20–39 years old.

Purpose

The purpose of this quantitative study was to improve understanding of motivational factors in women ages 20–39 years old that lead to the incorporation of exercise into daily life. Currently, there is a lack of research on effective motivational factors for increasing daily exercise in women in this age group. This was the first study designed to determine readiness for change specifically in women ages 20–39 years old who desire to incorporate exercise into their daily lives. This study was designed to explore how independent variables (anaerobic vs aerobic exercise, access to social support, and readiness for change) affect daily exercise adherence.

Research Questions and Hypotheses

This study was guided by three research questions:

Research Question 1 (RQ1): Do the independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) impact the dependent variable (daily exercise adherence)?

Null Hypothesis ($H_0$1): Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do not impact the dependent variable (daily exercise adherence).

Alternative Hypothesis (H_a1): Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do impact the dependent variable (daily exercise adherence

Research Question 2 (RQ2): Does motivation to exercise interact with social support to predict daily exercise adherence?

Null Hypothesis ($H_0$2): Motivation to exercise does interact with level of social support to predict daily exercise adherence.

Alternative Hypothesis (H_a2): Motivation to exercise does not interact with level of social support to predict daily exercise adherence.

Research Question 3 (RQ3): Does motivation to exercise interact with readiness to change to predict daily exercise adherence?

Null Hypothesis ($H_0$3): Motivation to exercise and readiness for change interact with each other to predict daily exercise adherence.

Alternative Hypothesis (H_a3): Motivation to exercise and readiness for change do not interact with each other to predict daily exercise adherence.

Theoretical Framework

TM (Prochaska et al., 1994) offers guidance on ways to understand motivational factors throughout the stages of change. TM addresses the various levels of readiness that individuals experience, including precontemplation, contemplation, preparation, action,

and maintenance when deciding whether to engage in behavior to increase overall well-being with regard to health (Prochaska et al., 1994). TM has predominately been used to determine levels of change in individuals with substance abuse concerns (Macchi, Russell, & White, 2013). This theory has only recently been implemented to determine what level of change individuals are currently in when beginning fitness programs (Macchi et al., 2013). Subsequent research into use of TM as applied to increasing motivation for the daily implementation of exercise may offer insight into helping individuals begin and maintain such practices (Ohlendorf, 2012).

Nature of the Study

I used a quantitative research design for this study. I used a survey to attempt to yield data on understanding how readiness for change can increased daily exercise in women ages 20–39 years old. A survey is an inexpensive way to efficiently and quickly collect data from participants (Leffingwell, 2006). Independent variables for this study included type of exercise women engage in (anaerobic vs. aerobic), access to social support, and readiness for change as evidenced by the Exercise Motivations Inventory–2 (EMI-2; Markland, 1997). The EMI-2 (Markland, 1997) is in the public domain. I sought to determine if there was a correlation between readiness for change and implementing regular exercise to increase motivational factors.

Based on the assumption that the multiple regression would have three independent variables, a sampling of at least 100 respondents was adequate to detect at minimum a medium effect size. According to Cohen (1988), a medium effect size is needed for scientific studies to indicate a relationship between variables. I recruited one

hundred women from specific Facebook groups of which I was not a member, that focus on exercise. Once recruited, the women accessed an online survey via SurveyMonkey.com.

The survey included four original questions: (a) which type of exercise do you primarily engage in on a regular basis, (b) are you ready for lifestyle changes to be a part of your daily routine, (c) how much support can your family and friends provide, and (d) how many days per week do you exercise? In addition to the four original questions, I administered the EMI-2 (Markland, 1997) to measure the type of exercise women engage in, access to social support, and readiness for change. I did not provide compensation to participants for completing the study. I analyzed the data using the student edition of the Statistical Package for the Social Sciences (SPSS).

Definitions

Aerobic exercise: Aerobic exercise is defined as a form of physical activity producing an elevated heart rate and respiratory volume to meet oxygen requirements of muscles (Wang & Zu, 2017).

Anaerobic exercise: Anaerobic exercise is defined as an intense form of physical activity that causes lactate to build up in the muscles of the body (Wiecek, Maciejczyk, Szymura, Szygula, & Kantorowicz, 2015).

Consciousness raising: Consciousness raising refers to the process of a person acquiring further information about his or her problem behavior (Campbell, Eichhorn, Early, Caraccioli, & Greeley, 2012; Conner et al., 2009) including consequences, causes, and treatment for problem behavior (Lenio, 2006).

Daily exercise adherence: Daily exercise adherence refers to the act of engaging in either aerobic or anaerobic exercise for at least 30 minutes each day.

Dramatic relief: Dramatic relief is an emotional response to the problem at hand (Campbell et al., 2012; Conner et al., 2009). It involves emotional arousal and psychological relief for a person who may be considering changing negative behaviors. Dramatic relief at an emotional level prompts a person to think about her or his problem behavior and can evoke feelings of guilt, fear, embarrassment, and hope (Conner et al., 2009).

Environmental reevaluation: Environmental evaluation is the process of a person being prompted to think about how her or his problem behavior affects others (Campbell et al., 2012) and can been referred to as social reappraisal (Velicer, Prochaska, Fava, Norman, & Redding, 1998).

Readiness for change: Readiness for change refers to an individual's level when deciding to engage in behaviors intended to increase overall health and well-being (Prochaska et al., 1994). The levels of readiness are precontemplation, contemplation, preparation, action, and maintenance (Prochaska et al., 1994).

Self-reevaluation: Self-reevaluation is the process of a person contemplating how behavioral change will affect her or his identity (Campbell et al., 2012; Longmire-Avital, Golub, & Parsons, 2010).

Social liberation: Social liberation is being aware of and accepting behaviors deemed appropriate by society (LaMorte, 2016; Woods, Mutrie, & Scott, 2002) and increasing opportunities to engage in nonproblematic behavior (Romain, Caudroit,

Hokayem, & Bernard, 2018). Social liberation elicits a person to actively work on changing the problem behavior (Mander et al., 2014).

Social support: Social support is defined as friends and family members of the individual (Wang, Pbert, & Lemon, 2014).

Assumptions

I made two assumptions in designing this study. The first assumption was the participants would respond to the survey questions honestly and the second was the participants who completed the survey engaged in exercise at a minimum of 4 days a week.

Scope and Delimitations

I used the research questions to focus on weight loss motivation in women ages 20–39 years old based on four variables: anaerobic versus aerobic exercise, access to social support, readiness for change, and daily exercise adherence. The criteria included in the study required participants to be women residing in the United States, ages 20–39 years old who engage in regular, anaerobic and/or aerobic exercise. Individuals who did not meet these criteria were excluded from the study. Due to this, the results of the study cannot be generalized to any other populations. The results may, however, encourage other researchers to use the basis of this study to research other populations.

Limitations

This study had two limitations. The survey, the EMI-2, along with four additional questions, have not previously been used to evaluate levels of exercise motivation in women ages 20–39 years old. A second limitation was the possibility of

participants answering questions in ways they thought were more socially acceptable rather than with truthful answers. To prevent this from occurring, I told participants that all surveys would be confidential and no personal information would be collected.

Significance

This research fills a gap in understanding successful motivational factors focusing specifically on increasing motivation to incorporate exercise into daily life in women ages 20–39 years old. This project was unique because it addressed a population of women who experienced the most dramatic increase in obesity levels in the United States over the last 20 years. The results may provide insight into the motivational factors women can incorporate to successfully implement exercise into daily life. Insight from this study may contribute to the scholarly literature on helping women ages 20–39 years old successfully implement motivational strategies into daily life. Findings from this study may lead to positive social change by helping to decrease the obesity epidemic in the United States (National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], 2011).

Summary

Previous researchers have found a need to increase motivation to implement daily exercise in women (Iso-Ahola & Miller, 2016; Rackow et al., 2013; Stevens & Bryan, 2015). TM only recently has been implemented to determine what level of change women are in when beginning fitness programs (Macchi et al., 2013). Researchers have used TM as a framework for studying substance abuse populations, those with eating disorders, and juvenile delinquents. There is limited research with TM

and incorporating exercise into daily lifestyle (Byom & Sapp, 2013; Dinger et al., 2007;

Findorff et al., 2007; Johnson et al., 2008; Yang et al., 2015). Chapter 2 will provide the

literature search strategy, theoretical foundation, literature review related to key

variables and summary and conclusions.

Chapter 2: Literature Review

Introduction

The purpose of this quantitative study was to examine whether type of exercise (i.e., anaerobic vs. aerobic exercise), access to social support, and readiness for change may lead to increased motivational factors in women ages 20–39 years old. Obesity levels have steadily risen over the last 20 years (Shields, Carroll, & Ogden, 2011). In 2015, 28% of adults in the United States were deemed obese (Pianan, 2016; Witters, 2016). Among women ages 20–39 years old in the United States, obesity levels have increased by 13.3% since the early 1990s (Shields et al., 2011). The age-adjusted prevalence of obesity for women in the United States was 40.4% in 2014 (Flegal, Kruszon-Moran, Carroll, Fryar, & Ogden, 2016). As such, obesity is a concern to health care professionals in the United States because of its association with high health care costs and mortality rates, particularly among women (CDC, 2013; Shields et al., 2011; Smith & Smith, 2016).

Women tend to be more sedentary than men (Findorff, Stock, Gross, & Wyman, 2007), leading to a lifestyle that can result in obesity (CDC, 2014; Findorff et al., 2007). Only one in five people (approximately 21% of the United States population) meets the physical activity guidelines set by the CDC (2013), which encourages 2.5 hours per week of aerobic exercise for adults age 18 years and older. Committing to an exercise program, however, can be difficult. As many as half the people who begin an exercise program discontinue participation within the first 6 months (Findorff et al., 2007).

In tandem with the increase of overweight and obese individuals in the United States, treatment costs have risen over the last 20 years. More than $190 billion per year is spent treating obesity and obesity-related complications, representing approximately 21% of total United States health care expenditures (Smith & Smith, 2016). As such, lowering the obesity rates in the United States would benefit not only individual health concerns but the amount of money the federal government spends each year on health care.

In light of the problem of obesity among women, the purpose of this study was to examine the motivational factors in women ages 20–39 years old that may lead to their incorporating exercise into daily life. This chapter begins with the literature search strategy, moves on to the theoretical foundation of the study, which is TM, and then onto the literature review related to key variables and concepts which include exercise, motivation, social support, readiness for change, body image, obesity levels in the United States, social physique anxiety, hypnosis, behavioral modification, lifestyle change, behavior, body dissatisfaction, perceived support, support systems, and overweight females in the United States. The final section is the summary and conclusions.

Literature Search Strategy

This literature review brought to light multiple concepts specific to women, exercise, and increasing motivation to exercise each day. My initial search included a broad scope of literature from PsycARTICLES and PsycINFO databases. Because of limited results from these databases, I performed an additional search for peer-reviewed articles in the EBSCOhost and Academic Search Premier databases. I searched the

following key terms to obtain full length, peer-reviewed articles spanning from 2006 to the present: *women and exercise, obesity in females, female motivation, exercise motivation, support for exercise,* and *obligation to exercise.* Older articles written in the 1980's through 1990's provided information on the origins of TM. I found relatively few articles (Chu, Bushman, & Woodard, 2008; Dishman, Vandenberg, Motl, & Nigg, 2010; Findorff et al., 2007; Guthman, 2013; King, 2013; Lam, Law, Chan, Wong, & Zhang, 2015; LaMorte, 2016; Macchi, Russell, & White, 2013; Nigg, 2010; Melbye, Tenenbaum, & Eklund, 2008; Prochaska & DiClemente, 1983; Rackow et al., 2013; Ruby, Dunn, Perrino, Gills, & Viel, 2011; Stoltz, Reysen, Wolff, & Kern, 2009; Wang, Pbert, & Lemon, 2014) that addressed the needs of this dissertation topic.

I narrowed the literature review to more specific search terms including *social relationships, behavior, exercise, motivation,* and *women.* Additional search terms I used included *transtheoretical model of change, motivation to exercise, exercise participation, body image, obesity levels in the United States, social physique anxiety, hypnosis, behavioral modification, lifestyle change, behavior, body dissatisfaction, perceived support, support systems,* and *overweight females in the United States.* I reviewed more than 150 articles, government documents, and websites, of which only 65 sources were relevant to this literature review.

Theoretical Foundation

TM, developed by Prochaska and DiClemente (1983), provided the framework for this dissertation. TM addresses the various levels of readiness that individuals experience, including precontemplation, contemplation, preparation, action, and maintenance when deciding whether to engage in behavior to increase overall well-being with regard to health (Prochaska et al., 1994). The rationale for using TM as the theoretical foundation for this study was to provide additional insight into helping women increase motivation factors such as readiness for change to implement exercise into a daily routine.

Origin and Purpose of TM

History of TM. Prochaska and DiClemente began working on TM in the 1970s but did not begin publishing their work until 1984 (LaMorte, 2016). TM has primarily been used to assess readiness for change with substance abuse issues (LaMorte, 2016; Macchi et al., 2013). In addition, eating disorders and juvenile delinquent behavior have also been studied from the perspective of TM (Parrilla, 2016; Prochaska et al., 1994).

Prochaska and DiClemente (1983) addressed various levels of readiness for change experienced by people attempting to change behavior. In Prochaska and DiClemente's transtheoretical model, levels are precontemplation, contemplation, preparation, action, and maintenance. Levels were designed to determine readiness for change regarding behaviors intended to increase overall health and well-being (Prochaska et al., 1994).

Purpose and Components of TM. TM was the theoretical lens through which I analyzed the data with regard to any correlation found between increasing motivational

factors such as readiness for change and implementing daily exercise. TM only recently

has been implemented to determine what level of change women are in when beginning

fitness programs (Macchi et al., 2013). Select transtheoretical constructs (meeting activity

level versus not meeting activity level) have been correlated with change in physical

activity (Dishman, et al., 2010). As explained below, TM has five cognitive-affective

components, including consciousness raising, dramatic relief, environmental

reevaluation, self-reevaluation, and social liberation as well as five behavioral

components that include reinforcement management, counterconditioning, helping

relationships, self-liberation, and stimulus control (Baumann et al., 2013).

Cognitive-affective components of TM. Consciousness raising, dramatic relief

(Conner et al., 2009), and environmental reevaluation (Campbell, Eichhorn, Early,

Caraccioli, & Greeley, 2012) are vital processes of moving from the precontemplation

stage to the contemplation stage of TM. These cognitive-affective processes elicit an

emotional response such as guilt or embarrassment about problem behavior from a person

(Goldfried, 2013). This emotional response may prompt a person to move through the

cognitive-affective processes to act upon changing her or his problem behavior

(Goldfried, 2013).

Consciousness raising. Consciousness raising refers to the process of a person

acquiring further information about his or her problem behavior (Campbell et al., 2012;

Conner et al., 2009) including consequences, causes, and treatment for problem behavior

(Lenio, 2006). Further education may be obtained through researching the topic, taking

educational courses, and attending seminars. A woman who is contemplating

incorporating daily exercise into her life may utilize consciousness raising when speaking with other people who are also struggling with exercise. She may obtain further information through these conversations with others (Romain et al., 2018).

Dramatic relief. Dramatic relief is an emotional response to the problem at hand (Campbell et al., 2012; Conner et al., 2009). It involves emotional arousal and psychological relief for a person who may be considering moving from the precontemplation stage to the contemplation stage of TM. Dramatic relief at an emotional level prompts a person to think about her or his problem behavior and can evoke intense feelings of guilt, fear, embarrassment, and hope (Conner et al., 2009). An example of dramatic relief would be a woman who is unable to open a can feeling embarrassment about not having muscle strength. These feelings may prompt her to implement daily exercise into her lifestyle to improve muscle strength. The feelings of embarrassment may prompt the woman to begin to move to the contemplation stage of TM and provide feelings of relief due to the decision to begin to change her problem behavior (Conner et al., 2009).

Environmental reevaluation. Environmental evaluation is the process of a person being prompted to think about how her or his problem behavior affects others (Campbell et al., 2012) and can been referred to as social reappraisal (Romain et al., 2018). An example of environmental reevaluation is a woman considering how her sedentary lifestyle affects those in her family, such as her children. Positive mother-daughter relationships appear to be very influential in family dynamics and household behaviors

(Sorkin, 2014). She may also involve her daughter in plans for implementing exercise into the family's routine (Sorkin, 2014).

   Self-reevaluation. Self-reevaluation is the process of a person contemplating how behavioral change will affect her or his identity (Campbell et al., 2012; Longmire-Avital, Golub, & Parsons, 2010). With regard to women, a woman will assess how she views herself with the negative behavior as well as without the negative behavior (Lenio, 2006). Self-reevaluation has been found to be one of the most important processes of TM (Longmire-Avital et al., 2010), typically occurring when a person is ready to move from contemplation to preparation (Lenio, 2006). A woman who has contemplated discontinuing sedentary habits and incorporating daily exercise into her daily routine may use self-reevaluation to envision how she may look and feel after incorporating exercise into her life. By viewing exercise as a positive lifestyle change, self-reevaluation may allow her to see how her life may be improved by exercise.

   Social liberation. Social liberation is being aware of and accepting behaviors deemed appropriate by society (LaMorte, 2016; Woods, Mutrie, & Scott, 2002) and increasing opportunities to engage in nonproblematic behavior (Romain, 2018). A woman may engage in social liberation by taking a walk during a lunch-hour break with work colleagues rather than ordering take-out food items. By accepting and engaging in behavior deemed appropriate by society, a woman may experience feelings of acceptance by peers and liberate herself from feelings of disapproval felt when engaging in the problem behavior (LaMorte, 2016; Lenio, 2006).

Behavioral components. Behavioral components of TM include reinforcement management, counterconditioning, helping relationships, self-liberation, and stimulus control (Kanning, 2010; LaMorte, 2016; Romain et al., 2018). These behavioral processes elicit a person to actively work on changing the problem behavior (Mander et al., 2014).

Reinforcement management. Reinforcement management is a method of providing rewards for positive behavior (Kanning, 2010). Positive behaviors are rewarded, and rewards are withheld for negative behaviors. Reinforcement management has been proven effective for people with drug abuse concerns (Christensen et al., 2014; Stott et al., 2015). Christensen et al. (2014) determined that monetary rewards for positive behaviors were especially effective. Building on the idea of using monetary rewards for positive behaviors, if a woman engages in exercise for five days in a row, she may reward herself on the weekend with five dollars toward the purchase of an item she has been desiring such as a purse or pair of shoes. On the contrary, if the woman decides 5 days in a row is the requirement for obtaining the reward (i.e. five dollars) and does not engage in exercise for the required period of time she will withhold the monetary reward of five dollars toward the items she desires.

Counterconditioning. Counterconditioning is the act of learning new, positive behaviors to substitute for negative behaviors (Kanning, 2010; Romain et al., 2018). Counterconditioning has been used and found effective in discontinuing and replacing negative behaviors such as drug abuse (Christensen et al., 2014; Stott et al., 2015)

Regarding implementing daily exercise, a woman may begin to go to the gym and engage in exercise after work instead of being sedentary and watching television.

Helping relationships. Helping relationships are relationships with others that promote trust, caring, and acceptance of the change of behavior (Kanning, 2010; Romain et al., 2018). Helping relationships can include friends, family members, and medical staff, as well as other people struggling with changing negative behaviors (Romain et al., 2018). Social supports have been proven to be effective in eliciting positive behavior change in some individuals (Macchi, 2013; Sorkin, 2014). When a member of a household is attempting to implement a healthier lifestyle, the family as a unit is affected and has the potential to either help or hinder the person's efforts toward a healthier lifestyle (Macchi, 2013).

Self-liberation. Self-liberation is a person's personal belief that behavioral change is possible (Kanning, 2010; LaMorte, 2016; Middlekamp, van Rooijen, Wolfhagen, & Steenbergen, 2017; Woods et al., 2002). It is also the commitment a person makes toward behavioral change and the course of action to take to achieve the change (LaMorte, 2016). Self-liberation can take the form of public announcements of intention to change (Lenio, 2006). When a woman decides to begin to incorporate exercise into daily life, she may make a public announcement of her goals on social media outlets such as Facebook, Twitter, or Instagram. This public announcement would be self-liberation (Lenio, 2006).

Stimulus control. Stimulus control is limiting people, places, or items that may trigger a person to relapse and engage in negative behavior (Kanning, 2010; LaMorte, 2016) and replacing these potential triggers with prompts to engage in positive behavior

(Velicer et al., 1998). Stimulus control has found to be effective in discontinuing gambling habits (Soberay, Grimsley, Faragher, Barbash, & Berger, 2014). People with gambling addiction who limit access to casinos and online gambling websites are more likely to have success with discontinuing a gambling habit (Soberay, 2014). A woman who wants to incorporate daily exercise into her lifestyle may avoid watching favorite television shows, as this would likely require her to be sedentary.

Stages of the Transtheoretical Model

In the first stage known as the pre-contemplation stage, a person has no intention of changing behaviors (Prochaska & DiClemente, 1984). In other words, in the pre-contemplation stage the person is not yet even thinking about changing her behavior (Findorff et al., 2007).

During the contemplation stage, a person begins to think about changing behavior, but does not begin to take any action or make plans of change (Prochaska & DiClemente, 1983). For example, a person may begin to think about improving overall health and incorporating exercise in the next 6 months, but no action is specifically taken to improve overall health (Findorff et al., 2007).

In the preparation stage, a person begins to make plans of changing behaviors and commits to making changes in her or his life (Prochaska & DiClemente, 1983). During this stage, for example, a person begins to make solid plans of changing her or his lifestyle within the next month to obtain a healthier lifestyle by incorporating exercise into a daily routine (Findorff et al., 2007). It is during this stage that a person makes the

commitment to change. Then, in the action stage, a person makes changes in her or his life to progress toward goals.

The action stage is the stage in which changes and improvements are implemented. For instance, exercise is regularly incorporated into a person's lifestyle, but for less than 6 months in the action stage (Findorff et al., 2007).

After moving through the first four stages, a person enters the maintenance stage (Prochaska & DiClemente, 1983). During this stage, a person focuses on preventing relapse of negative behaviors and maintains positive behaviors (Mander et al., 2014). In the maintenance stage, a person regularly exercises for 6 months or longer (Findorff et al., 2007).

<div align="center">**Types of Exercise and Their Benefits**</div>

Exercise has been proven effective in increasing overall well-being (Nagel, Sonnentag, & Kühnel, 2015), and increasing physical and mental health (Guthman, 2013; King, 2013; Stoltz, Reysen, Wolff, & Kern, 2009). Exercise refers to using isolated or multiple muscle groups to expend energy (Kravitz & Vella, 2015). A person may engage in four different types of exercise: aerobic, strength, flexibility, and balance (Friends of the National Library of Medicine [FNLM], 2012). This study focused on aerobic and anaerobic exercise because these two types of exercise are widely used by women for weight loss (Missett, 2017).

Aerobic Exercise

One beneficial type of exercise that a person may engage in is aerobic exercise, also known as cardiovascular exercise. The CDC (2013) has recommended that men and

women should participate in at least 2 hours and 30 minutes per week of aerobic activity. A woman who meets this activity level is considered having met the moderate activity level (Christenson, 2013). Aerobic exercise promotes improved breathing and heart rates (Thøgersen-Ntoumani, Shepherd, Ntoumanis, Wagenmakers, & Shaw, 2016). Examples of aerobic exercise include running, stair climbing, and dancing.

Anaerobic Exercise

Another beneficial type of exercise that women may engage in is anaerobic exercise. Anaerobic exercise promotes strength, power, and can improve speed performance (Bhattacharya, 2013; Sandbakk, 2015). Examples of anaerobic exercise include sprinting (Sandbakk, 2015), High Intensity Interval Training (HIIT), and weight lifting (Bhattacharya, 2013).

Benefits of Exercise

Research has demonstrated that exercise is the most important activity a person can participate in to improve her or his overall health (Bassuk, Church, & Manson, 2013). Exercise is more effective than dieting for sustained weight loss (Dansinger & Schaefer, 2006). Aerobic exercise increases blood to the brain which may help cognitive functioning (Hötting et al., 2012). Exercise not only improves physical health; it also improves mental health. Women who regularly engaged in exercise programs were found to have an increase in overall well-being and a decrease in depressive symptoms (Earnest, Blair, & Church, 2012). Women who reported having healthy support systems, including family members and friends, were more inclined to participate in exercise and in turn had a healthier outlook on life (Van Dyck et al., 2014). Still, only about 22% of the

population in the United States regularly engages in exercise (Iso-Ahola & Miller, 2016),

among whom only 18% of women meet the "moderate" activity level recommended by

the CDC (2013). This percentage has held steady for women age 18 years and older in

the United States over the last 4 decades (CDC, 2012; Church et al., 2011).

Motivation to Implement a Lifestyle Change

Motivational factors determine if a woman engages in exercise (Kilpatrick, 2005).

Still unknown is whether motivation to implement a lifestyle change, such as engaging in

daily exercise, comes from conscious or unconscious thought processes (Iso-Ahola &

Miller, 2016). If motivation to implement a lifestyle change is conscious, then behavioral

modification may be an effective way to increase motivation. Carvalho, Mazzoni, and

Kirsch (2014) theorized that if motivation to implement a lifestyle change is unconscious,

then hypnosis may be beneficial to implement behavioral change, including women's

desire to engage in daily exercise (Byom & Sapp, 2013). Hypnosis is a noninvasive,

psychological and medical treatment that may be used to create behavioral change by

increasing suggestibility (Carvalho et al., 2014) and enhancing experience and behavior

(Byom & Sapp, 2013). If a woman engages in hypnosis to create behavioral change and

improve suggestibility to implement daily exercise, it may benefit the woman's overall

physical and mental health, as well as increase motivational factors to sustain daily

exercise patterns (Byom & Sapp, 2013).

Intrinsic and Extrinsic Motivation and Exercise

Motivation can be either intrinsic or extrinsic (Rackow, Scholz, & Hornug, 2013).

An intrinsic motivational factor in exercise adherence known as flow experience. Flow

experience is a state of heightened consciousness and increased awareness (Csikszentmihalyi, 1998). Csikszentmihalyi created the term flow experience to describe the feeling a person experiences when she or he becomes fully immersed in exercise. The person experiences a greater awareness of well-being and achieves greater feelings of well-being with flow experience (Rackow et al., 2013). Flow experience allows a person to feel more connected to the exercise experience and to get greater feelings of accomplishment from engaging in exercise activities (Rackow et al., 2013). For example, a woman who enjoys dancing may have a flow experience during a Zumba class. Zumba is a dance-based fitness program created by Alberto Perez in the 1980s and introduced to the United States in 1986 (Murphy, 2015). Since the woman enjoys dancing, she may become fully immersed in her Zumba class and feel completely connected with the exercise session. Flow experience may intrinsically motivate the woman to begin regular incorporation of Zumba in her life, promoting a healthy lifestyle.

Applying self-determination theory, Stevens and Bryan (2015) argued that motivation for exercise is primarily extrinsic for most women because they often exercise for reasons other than enjoying the act of exercise itself. Self-determination theory states that men and women seek relatedness as a basic psychological need (Stenling, Lindwall, & Hassmen, 2015). Stevens and Bryan (2015) found that most women exercise out of obligation rather than "because it feels good." Indeed, three of the primary reasons a woman age 20–39 years old may want to exercise are social physique anxiety (Chu, Bushman, & Woodard, 2008), feelings of sexual objectification and body dissatisfaction (Melbye et al., 2008).

Social physique anxiety. Social physique anxiety refers to a person's anxiety about how others perceive body structure (Chu, et al., 2008). Chu et al. (2008) found that women suffer from social physique anxiety symptoms more than men do. Specifically referring to women, even if a woman has not encountered negative remarks by others about her body, social physique anxiety may still be present. This anxiety can be caused by either a woman's real or perceived beliefs (Melbye et al., 2008).

Social physique anxiety can affect a woman's view on an appropriate location to take part in exercise, for example the gym opposed to home, with whom she exercises, and even what she wears while she exercises. Women with higher levels of social physique anxiety exercise at home, alone, while wearing loose fitting clothing in which they feel comfortable rather than in what is commonly deemed to be gym-appropriate female attire (e.g., sports bra and form-fitting exercise pants, commonly called yoga pants).

A woman's thinking that she is forced to conform to society's image of beauty and that she is unattractive unless she is thin can have an unhealthy effect on her mental health. Social physique anxiety can lead to eating disorders, the obsession to be considered thin by others, striving for perfection, feelings of sexual objectification, and body dissatisfaction (Melbye et al., 2008).

Sexual objectification. Women have been sexually objectified throughout the last several decades of history to be thin as well as beautiful (Melbye et al., 2008). In modern Western culture, women who are thin are viewed as more beautiful and sexually attractive than overweight females (Melbye et al., 2008). Feelings of sexual

objectification can be increased when a woman who is exercising is expected to wear a swimsuit, a revealing outfit, or form-fitting clothing. Women with higher levels of feelings of being sexually objectified have been found to engage in exercise for aesthetic reasons rather than overall health concerns (Melbye et al, 2008). Sexual objectification has been linked with mental health concerns including eating disorders, sexual disorders, increased depressive symptoms, and higher levels of social physique anxiety (Melbye et al., 2008). As discussed below, sexual objectification has also been linked to women having increased body dissatisfaction.

Body dissatisfaction. Body dissatisfaction has been linked to higher levels of exercise adherence among women (Melbye et al., 2008). Women who are dissatisfied with their current body structure, weight, or body mass index (BMI) have been found to be more concerned about health and losing weight than female counterparts who are satisfied with their current body structure, weight, or BMI. Body dissatisfaction has been associated with social physique anxiety. Over the last several decades, women have been conditioned to equate beauty with thinness (Melbye et al., 2008). If a woman is unable to obtain a small body structure either from a lack of motivation to lose weight or health conditions such as thyroid problems, then she may feel dissatisfied with her body structure. Women who feel increased social physique anxiety and body dissatisfaction may have difficulty discerning their own identity.

Identity Theory and Exercise

It is human nature to seek identity. Identity theory posits that women (in this case) look to their beliefs about themselves to determine their behavior (Reifsteck, Gill, &

Labban, 2016). For example, when a woman identifies as having an exercise identity, it refers to her personal self-image of engaging in regular exercise (Strachan, Perras, Brawley, & Spink, 2016). Exercise identity can grow stronger or weaker throughout the lifetime, depending on the woman (Reifsteck et al., 2016). If a woman begins to think that exercise is no longer beneficial, her exercise identity can begin to weaken. Likewise, if a woman decides to implement exercise into her daily routine and begins to engage in exercise daily, her exercise identity can become stronger (Reifsteck et al., 2016).

Exercise as Habit

Phillips and Gardner (2016) reported that incorporating exercise into one's daily routine comes from habit; however, as noted earlier, it is unknown if habits are formed through conscious or unconscious thoughts. If a habit is formed through conscious thought, one's motivational factors may be different than if a habit is formed through unconscious thought. When a habit is formed, behavioral changes are also formed and are more likely to remain intact for extended periods (Phillips & Gardner, 2016).

Social Support for Creating Healthier Habits

Social interactions are essential in one finding one's self-identity. Self-determination theory posits that people have three basic psychological needs: autonomy, competence, and relatedness (Lam, Law, Chan, Wong, & Zhang, 2015; Rackow et al., 2013). Autonomy refers to the ability to behave independently (Lam et al., 2015; Rackow et al., 2013). Competence refers to the ability to interact with the environment (Lam et al., 2015; Rackow et al., 2013). Relatedness refers to the ability to interact and have acceptance from others in the social environment (Lam et al., 2015; Rackow et al., 2013).

With these three basic psychological needs met, a person has a greater sense of overall well-being (Núñez & León, 2015). A woman seeking to meet all three needs may be comparing herself to women in her age cohort or to younger or older persons than she.

It is not uncommon for women to compare themselves to others when seeking to find their own self-identity. These comparisons are most common in terms of health and fitness (Verkooijen & de Bruijn, 2013). Social relationships can ultimately affect a woman's progress toward a healthier lifestyle, such as implementing exercise into her daily life. When a woman has a support system that views exercise as positive and rewarding, she is more likely to engage in regular exercise to be socially accepted by her support system (Ruby, Dunn, Perrino, Gills, & Viel, 2011). Social support includes friends and family members (Wang, Pbert, & Lemon, 2014).

Positive and Negative Social Relationships

Social support can both positively and negatively affect women (Van Dyck et al., 2014). If a woman's support system is not encouraging a healthier lifestyle, it is unlikely the woman will view a healthier lifestyle as important. If the woman's support system does not encourage her to engage in daily exercise, it is less likely that she will have the will power or motivation to engage in daily exercise on her own (Van Dyck et al., 2014). Van Dyck et al. (2014) reported that women with identified social supports (i.e., family and friends), were more inclined to engage in exercise and have a healthier outlook on life. Social relationships have also been associated with a woman's weight (Wang et al., 2014). When women have social support from friends and family members to implement

a healthier lifestyle, they may be more likely to engage in and stay dedicated to her healthier lifestyle goals.

A related aspect of self-determination theory is introjection, which refers to the idea that people engage in behaviors because of feelings of guilt and social pressure (Thøgersen-Ntoumani et al., 2016). Although social pressure is often seen as a negative influence, in terms of introjection and exercise motivation, it can be a positive influence. When a woman feels guilt and social pressure to exercise from support systems, she may be more inclined to participate in daily exercise. Indeed, women with access to a support system as well as access to a public gym, such as the Young Women's Christian Association (YWCA) or Planet Fitness, have been found to engage in exercise more regularly than women who do not use such facilities (Annesi & Tennant, 2013; Miller & Miller, 2009). Women who engage in group exercise programs have been found to have an improvement in overall well-being (Gutierrez et al., 2012) and have a sense of community and obligation to others to attend the group exercises sessions, based on perceived expectations from other members. If she does not come to a session, other people may notice her absence (Thøgersen-Ntoumani et al., 2016) and even question her upon her return to the group exercise program sessions or express disappointment in her inability to be present at a group exercise program session.

Readiness for Change for a Healthier Lifestyle

Most existing literature focusing on implementing a healthier lifestyle is based on changes in exercise and nutrition, and on behavioral modification techniques (Macchi et al., 2013), which appear to be the key components for implementing a healthier lifestyle

and engaging in weight loss (Byom & Sapp, 2013; King, 2013; Macchi et al., 2013; Nagel, Sonnentag, & Kühnel, 2015; Stoltz et al., 2009). Few researchers have focused on readiness for change to determine success with implementing a healthier lifestyle in terms of implementing daily exercise into a woman's lifestyle (Byom & Sapp, 2013; Dinger, Heesch, Cipriani, & Qualls, 2007; Johnson et al., 2008; Findorff et al., 2007; Yang et al., 2015). Readiness for change can vary from woman to woman. If a woman is unable to identify negative associations with non-engagement in daily exercise during the pre-contemplative stage, according to the TM model, she will be less willing to commit to implementing exercise into daily life (Baumann et al., 2013). According to TM, women in the contemplative stage are more likely to view both pros and cons of implementing daily exercise into lifestyle. If a woman can view the positive associations with implementing daily exercise into lifestyle, there may be an increased chance that she will exercise daily.

In the action stage, self-perceived level of "fitness" is a factor in committing to an exercise program. Women who consider themselves to be fit are more likely than women who consider themselves to be unfit to stay committed to exercise programs (Thøgersen-Ntoumani et al., 2016). It is unknown if women who consider themselves to be fit are intrinsically motivated to engage in exercise. Ideally, if motivational factors were increased to allow women to identify as fit, they would begin to exercise each day (Thøgersen-Ntoumani et al., 2016).

Summary

In Chapter 2, I presented an overview of the history of the use of TM with populations such as those with addiction and eating disorders, and with juvenile delinquency. I reviewed the literature on TM, exercise, motivation, readiness to change, and social support systems. The literature suggested that women benefit from various aspects of exercise and that motivational factors to exercise include social physique anxiety, body dissatisfaction, and the possibility of finding a true sense of identity. Primarily, I reviewed literature on the importance of exercise regarding both physical and mental health for females.

Exercise has been shown to be an effective method for weight loss as well as to improve overall mental health in women (Guthman, 2013; King, 2013; Nagel et al., 2015; Stoltz et al., 2009). Exercise improves the physical body and decreases the risk of obesity and complications of obesity such as death (Nagel et al, 2015). In the United States, 25% of female deaths per year in the United States are attributed to being overweight and associated factors of being overweight (CDC, 2013). In 2015, 28% of adults in the United States were deemed obese (Pianan, 2016). As such, it is to the benefit of the health of women in the United States to find a course of action to improve these statistics. The evidence suggested that daily exercise adherence may help decrease the obesity levels in the United States.

Conclusions

Continued research is needed to determine how exercise motivation interacts with social support to predict time spent exercising daily, as well as how exercise motivation

interacts with readiness to change to predict time spent exercising daily. In addition, continued research is needed to determine how type of exercise (i.e., anaerobic vs. aerobic exercise), access to social support, and readiness for change correlate with daily exercise adherence and time spent exercising.

Theories central to weight loss were examined, but a primary focus was TM, the main theoretical framework for this study. Although researchers have used TM as a framework for studying substance abuse populations, those with eating disorders, and juvenile delinquents, there is limited research with TM and incorporating exercise into daily lifestyle (Byom & Sapp, 2013; Dinger et al., 2007; Findorff, et al., 2007; Johnson et al., 2008; Yang, et al., 2015). Researchers have indicated further research is needed on increasing motivational factors to create behavioral change (Iso-Ahola & Miller, 2016; Rackow et al., 2013; Stevens & Bryan, 2015). This study fills a gap in the scholarly literature and improves understanding of motivational factors in ages 20–39 years old that lead to the incorporation of exercise into their daily lives.

I conclude the chapter by noting the need for additional research on motivational factors to increase daily exercise patterns in women, specifically those ages 20–39 years old. Motivational factors were hypothesized to be affected by type of exercise, access to social support, and readiness to change. Chapter 3 will include the purpose of this study; research design and rationale of the design; details of the population, sampling, and sampling procedures; procedures for recruitment, participating, and data collection methods; threats to validity and ethical procedures; and a summary.

Chapter 3: Research Method

Introduction

The purpose of this study was to improve understanding of motivational factors that lead women in the United States ages 20–39 years old to incorporate exercise into their daily lives. This chapter includes information on the research design and rationale, methodology (population, sampling and sampling procedures, procedures for recruitment, participation, data collection, instrumentation and operationalization of constructs), data analysis plan, threats to validity, and ethical procedures.

Research Design and Rationale

The independent variables in this study were type of exercise (i.e., anaerobic vs aerobic exercise), access to social support, readiness for change, as well as motivation to exercise as evidenced by the EMI-2 (Markland, 1997; see Appendix A). The dependent variable was daily exercise adherence. A multiple regression analysis was used to evaluate research questions.

Online surveys were the primary instrument for measuring type of exercise, access to social support, readiness for change, and daily exercise adherence. I collected a convenience sample of 100 participants from various Facebook groups that focus on exercise.

A survey was the best way to collect relevant information from these participants. Only multiple-choice questions were provided on the survey to decrease risk of marginalia. Marginalia refers to spontaneous comments offered by participants while completing a survey (McClelland, 2016). The EMI-2 (Markland, 1997) is a cost-effective

and efficient survey for quickly obtaining information from these participants in a short time.

The following research questions guided this study:

Research Question 1 (RQ1): Do the independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) impact the dependent variable (daily exercise adherence)?

Null Hypothesis ($H_0$1): Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do not impact the dependent variable (daily exercise adherence).

Alternative Hypothesis (H_a1): Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do impact the dependent variable (daily exercise adherence

Research Question 2 (RQ2): Does motivation to exercise interact with social support to predict daily exercise adherence?

Null Hypothesis ($H_0$2): Motivation to exercise does interact with level of social support to predict daily exercise adherence.

Alternative Hypothesis (H_a2): Motivation to exercise does not interact with level of social support to predict daily exercise adherence.

Research Question 3 (RQ3): Does motivation to exercise interact with readiness to change to predict daily exercise adherence?

Null Hypothesis ($H_0$3): Motivation to exercise and readiness for change interact with each other to predict daily exercise adherence.

Alternative Hypothesis (H_a3): Motivation to exercise and readiness for change do not interact with each other to predict daily exercise adherence.

Methodology

Population

The target population was women ages 20–39 years old in the United States, accounting for approximately 27% of the United States population (U.S. Census Bureau, 2015). This target population comprises 25.3% White women, 28.7% Black women, and 33.2% Asian American women; the remaining women identified as "other" (U.S. Census Bureau, 2015). I sought a convenience sample of 100 respondents from various Facebook groups that focus on female health and fitness.

Sampling and Sampling Procedures

I recruited a selective sampling of women ages 20–39 years old in the United States to complete the online survey. I used *G*Power* software version 3.1.9.2 (Faul, Lang, & Buchner, 2007) to compute the appropriate minimum sample size needed for a multiple regression analysis. This program computes the effect size, power, and correlation among repeated measures. Based on the assumption the multiple regression had three independent variables, a .15 effect size (medium effect size), alpha level of .05, and power of .95 (95% chance of detecting a significant effect if one actually exists in the real world), the minimum sample size needed for this particular study was 89. According to Cohen (1988), a medium effect is an appropriate effect size for scientific research studies. Therefore, a sampling of at least 100 respondents was adequate to detect at minimum a medium effect size.

Procedures for Recruitment, Participation, and Data Collection

Recruiting occurred online through social media posts in Facebook groups

focused on female health and fitness. I included information on the purpose of the study

and the age group I was studying, as well as how to reach me if interested.

Informed consent, including purpose of the study, confidentiality, information

about how the study will be used in a dissertation, and rights associated with participation

in the study was provided to each participant prior to being permitted access to the

survey. Participants were required to read and click an "I agree" button confirming that

they agreed to the terms and conditions of the informed consent agreement. I collected

data through an online survey created on SurveyMonkey.com, which assigned

participants an identification number to ensure no personal information was collected.

As part of the informed consent process, and prior to taking the survey,

participants were informed that they may leave the study at any time, without any

penalties or repercussions. Once participants completed the survey, they were offered

debriefing services prior to exiting the study. They received the contact information for

Petroski & Associates in case they needed a free counseling session due to participation

in the survey (See Appendices C and D).

Instrumentation and Operationalization of Constructs

The survey instrument included two sections: one to screen participants, with the

informed consent, to determine if they qualify; and the survey itself, including four

original questions to obtain further information about type of exercise, access to social

support, readiness for change, and exercise adherence. A full version of the EMI-2

(Markland, 1997) was also administered to determine exercise motivation. No permission is required to use the EMI-2 (Markland, 1997) for research purposes (see Appendix E).

The original EMI was created by Markland and Hardy in 1993 to measure individuals' reasons for engaging in exercise. The EMI consisted of 12 scales: stress management, weight management, recreation, social recognition, enjoyment, appearance, personal development, affiliation, ill-health avoidance, competition, fitness, and health pressures. Markland further refined the EMI in 1997 after finding weaknesses with the scales of the EMI. Weaknesses included the low internal consistency of the fitness related scales, negative connotations connected to the health-related scales, and the phrasing of the instrument which made it only applicable to individuals who engage in exercise.

The refined version of the EMI is referred to as the EMI-2 and is composed of 51 questions based on a Likert scale rating 0 (*not at all true for me*) to 5 (*very true for me*). Each question is assigned to one of fourteen scales: stress management, revitalization, enjoyment, challenge, social recognition, affiliation, competition, health pressures, ill-health avoidance positive health, weight management, appearance, strength and endurance, and nimbleness. Of the 51 questions on the EMI-2, each scale has 3–4 questions assigned. To determine the score for each scale, the mean of the 3–4 assigned questions are calculated.

Markland and Ingledew (1997) factorially validated the EMI-2 in 1997. In the pilot study, the EMI-2 was administered to 425 male and female civil servants including both exercisers and non-exercisers. Analyses were conducted in three different phases. Phase 1 examined the fit of the 14 factors of the EMI-2 separately to screen for and

eliminate poor indicators (Markland & Ingledew, 1997). Phase 2 consisted of pairing factors to screen for and eliminate ambiguous items. Phase 3 consisted of grouping conceptually related factors into five different sub-models (Markland & Ingledew, 1997). The fit and factorial invariance across gender of the five sub-models were also tested (Markland & Ingledew, 1997).

Multiple criteria were used in the assessment of fit when validating the EMI-2 including global fit by the x^2 likelihood ratio statistic, the root mean square error of approximation (RMSEA) including its p value for RMSEA < .05, the Goodness of Fit Index (GFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (Markland & Ingledew, 1997). In each of the phases, fit was determined to be excellent in phase 1, acceptable in phase 2, and good in phase 3 (Markland & Ingledew, 1997).

Ingledew, Markland, and Strömmer (2013) conducted a pilot study to determine the effects of motives as represented by the EMI-2 and gains as represented by newly created corresponding scales on exercise specific outcomes. In the study, 196 individuals ages 18 and older completed the assessment. The findings of the study were consistent with self-determination theory (Ingledew et al., 2013). Positive health, challenge, and affiliation generate autonomous regulation (Ingledew et al., 2013). The proposed model met the criteria for adequate fit: Satorra–Bentler scaled x^2 (362, N 196) 503.66, p< .01, SRMR .07, CFI .99, RMSEA .04; NNFI .98. Cronbach's alpha was above .70. Motive factors and gain factors all had positive correlations at the 95% confidence intervals (Ingledew et al., 2013).

Screening of participants. When a woman agreed to complete the survey, she clicked a link to SurveyMonkey to access the survey. The first step in completing the survey was agreeing to the informed consent. Once the participant read and agreed to it, she moved on to the screening questions. The first question was the participant's gender. The second question asked if the participant's age was between ages 20–39 years old at the time she completed survey. The third question asked if the participant engaged in anaerobic or aerobic exercise. The fourth question asked if the participant had already completed the survey for a different purpose. If the respondent indicated she was female, between the ages of ages 20–39 years old, engaged in either anaerobic or aerobic exercise, and had not previously filled out the survey, she was able to complete the full survey.

Survey. In the second section of this study, four original questions and the full version of the EMI-2 (Markland, 1997) were answered. Four original questions were created for this study to measure the variables of type of exercise, level of readiness for change, access to social support, and daily exercise adherence:

#1.   Which type of exercise do you primarily engage in on a regular basis?

#2.   Are you ready for lifestyle changes to be a part of your daily routine?

#3.   How much support can your family and friends provide?

#4.   How many days per week do you exercise?

Data Analysis Plan

I addressed the following in this section: the two-staged data analysis, the preliminary analysis and the main analysis.

Preliminary Analysis

The data I collected through the SurveyMonkey online survey were reviewed to ensure data are correct, complete, and not duplicated. This process is referred to as data cleaning (Meade & Craig, 2012). Once the data cleaning process was completed, I entered the data into the student version of the SPSS via multiple regression.

When running the multiple regression, assessment of assumptions were taken into consideration, including normality, multicollinearity, and homoscedasticity. For the test of normality, the distributions of the residuals are numerically determined rather than graphically using the Shapiro-Wilk test in SPSS. Multicollinearity is present when independent variables in a study are not independent from one another. Homoscedasticity is determined by utilizing scatter plots.

Main Analysis

I conducted the multiple regression to evaluate the following research questions:

RQ1: Do the independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) impact the dependent variable (daily exercise adherence)?

Daily exercise adherence was a dependent variable scored on a scale of 0 (*not at all*) to 8 (*7 days per week*). The independent variable of type of exercise was scored 0 (anaerobic exercise) and 1 (aerobic exercise). The independent variable of access to social support was scored on scales of 0 (*no support*) to 5 (*much support*). The independent variable of readiness for change was scored on a scale of 0 (*not ready*) to 5 (*very ready*).

$H_0$1: Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do not impact the dependent variable (daily exercise adherence).

H_a1: Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do impact the dependent variable (daily exercise adherence

RQ2: Does motivation to exercise interact with social support to predict daily exercise adherence?

The first independent variable of access to social support was scored on scale of 0 (*no support*) to 5 (*much support*). The second independent variable of motivation to exercise was determined by the EMI-2 (Markland, 1997). Daily exercise adherence was a dependent variable scored on a scale of 0 (*not at all*) to 8 (*seven days per week*).

$H_0$2: Motivation to exercise does interact with level of social support to predict daily exercise adherence.

H_a2: Motivation to exercise does not interact with level of social support to predict daily exercise adherence.

RQ3: Does motivation to exercise interact with readiness to change to predict daily exercise adherence?

The independent variable of readiness for change was scored on a scale of 0 (*not ready*) to 5 (*very ready*). The second independent variable of motivation to exercise was determined by the EMI-2 (Markland, 1997). Daily exercise adherence was a dependent variable scored on a scale of 0 (*not at all*) to 8 (*seven days per week*).

$H_0$3: Motivation to exercise and readiness for change interact with each other to predict daily exercise adherence.

H_a3: Motivation to exercise and readiness for change do not interact with each other to predict daily exercise adherence.

Threats to Validity

This section includes threats to validity (internal, external, and construct). Internal validity refers to research methods that allow researchers to potentially find a relationship between independent and dependent variables (Lund, 2012). External validity refers to the ability to generalize and potentially replicate research findings to other populations and settings (Lund, 2012). Construct validity refers to the degree an experiment measures what it intends to measure (Shuttleworth, 2017).

A threat to internal validity was the risk of nonresponse bias. If women who agreed to participate in the study did not complete the online survey in the allotted timeframe, the sample size would not be large enough and could affect the outcome of the results of the study. To prevent nonresponse bias, upon agreeing to the study, participants were sent and asked to complete the link to the short survey. Another threat to validity was the risk of participants answering questions with answers they deemed socially acceptable rather than 100% honestly. To prevent this from occurring, no personal identification was asked, and respondents were reminded that survey answers were confidential.

Elements that may have affected the external validity of the study were samples limited to women ages 20–39 years old in the United States, as well as the use of the

convenience sampling. Another limitation of the study was the fact that no known studies exist that have implemented the EMI-2 (Markland, 1997) specifically to improve understanding of motivational factors in women ages 20–39 years old that lead to the incorporation of exercise into daily life.

Ethical Procedures

This study did not take place until permission was granted by the Walden University Institutional Review Board (IRB), approval # 08-15-18-0118333. I strictly followed ethical standards set forth by the Walden University IRB to protect the ethical rights of all participants in this study. Informed consent paperwork was given to each study participant prior to being given access to the online survey to ensure that each participant was aware that they could be participating in a research study and that informed consent was required to participate in the study. No compensation was provided for participation. There were no conflicts of interest, or physical or emotional risk for those who participated.

A person's choice to participate in the study served as the agreement of informed consent. After the survey was completed, all participants received my contact information in case they had any questions, decided to withdraw from the study, or wanted to obtain a copy of the study at the completion of this dissertation. Participants were assured of confidentiality and informed that were able to leave the study at any time without any penalties.

Data will remain stored for 5 years and will then be deleted from my password-protected hard drive and password-protected USB drive, which will be stored in a locked

file cabinet for which I have the only key, in my locked residence. The survey will be
deleted from *SurveyMonkey* upon completion of my dissertation.

Summary

Chapter 3 included the introduction, research design and rationale, methodology
(population, sampling and sampling procedures, procedures for recruitment,
participation, and data collection, instrumentation and operationalization of constructs),
data analysis plan, threats to validity, ethical procedures, and summary.

The purpose of this study was to improve understanding of motivational factors
that lead women in the United States ages 20–39 years old to incorporate exercise into
their daily lives. Participants were recruited via social media posts in Facebook groups
focusing on female health and fitness. I collected data in an online survey using four
original questions and the EMI-2 (Markland, 1997) and analyzed using the student
edition of SPSS.

I followed ethical standards set forth by the Walden University IRB to protect the
ethical rights of all participants in this study. The study did not begin until the Walden
University IRB approval occurred. Each participant was sent a link to a SurveyMonke*y*
questionnaire upon agreeing to participate in the study. Once the participants visited
SurveyMonkey, they were asked to provide informed consent and then guided to the
survey. Each participant received my contact information in case any questions or
concerns arose.

In Chapter 4 I will discuss the results of the statistical analysis. The chapter includes the research questions listed at the beginning of Chapter 3. Chapter 4 also includes the introduction, data collection, results, and summary.

Chapter 4: Results

Introduction

The purpose of this study was to improve the understanding of motivational factors that lead women to incorporate exercise into their daily lives. The participants in this study were required to be women ages 20–39 years old residing in the United States who engaged in regular, anaerobic and/or aerobic exercise. Individuals who did not meet these criteria were excluded from the study. The research questions and hypotheses follow:

RQ1: Do the independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) impact the dependent variable (daily exercise adherence)?

$H_0 1$: Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do not impact the dependent variable (daily exercise adherence).

$H_a 1$: Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do impact the dependent variable (daily exercise adherence.

I scored the dependent variable of daily exercise adherence on a scale of 0 (*not at all*) to 8 (*7 days per week*). I scored the independent variable of type of exercise as 0 (aerobic exercise) and 1 (anaerobic exercise). I scored the independent variable of access to social support on scales of 0 (*no support*) to 5 (*much support*). I scored the independent variable of readiness for change as 0 (*not ready*) and 1 (*ready*).

RQ2: Does motivation to exercise interact with social support to predict daily exercise adherence?

$H_0 2$: Motivation to exercise does interact with level of social support to predict daily exercise adherence.

$H_a 2$: Motivation to exercise does not interact with level of social support to predict daily exercise adherence.

I scored the first independent variable of access to social support on scale of 0 (*no support*) to 5 (*much support*). I determined the score for second independent variable of motivation to exercise by the EMI-2 (Markland, 1997). I scored the dependent variable of daily exercise adherence on a scale of 0 (*not at all*) to 8 (*seven days per week*).

RQ3: Does motivation to exercise interact with readiness to change to predict daily exercise adherence?

$H_0 3$: Motivation to exercise and readiness for change interact with each other to predict daily exercise adherence.

$H_a 3$: Motivation to exercise and readiness for change do not interact with each other to predict daily exercise adherence.

I scored the independent variable of readiness for change as 0 (*not ready*) and 1 (*ready*). I determined the score for second independent variable of motivation to exercise by the EMI-2 (Markland, 1997). I scored the dependent variable of daily exercise adherence on a scale of 0 (*not at all*) to 8 (*seven days per week*).

In this chapter I cover the following: data collection including descriptive statistics of the respondent demographics, preliminary tests to determine if the assumptions of the multiple regression were met (normality, linearity, and homoscedasticity), and primary analyses of each research question. Finally, I cover a summary of the findings.

Data Collection

In the absence of published data on the inclusion criteria, I surveyed 106 individuals from various Facebook groups that focus on female health and fitness, with an 84% response rate. The recruitment and data collection time frame was 8 weeks. As stated in Chapter 3, I intended to survey 100 women, but 105 women and one man responded to the survey. Ninety-eight percent of the respondents were between the ages of 20–39 years old, and 93% engaged in either aerobic or anaerobic exercise regularly.

As shown in Table 1, 76 women ages 20–39 years old participated in the study. Participants were asked if they participate in aerobic exercise (69.7%) or anaerobic exercise (30.3%). A majority of the women reported a support level of 3 (30.3%), being ready to implement change in daily exercise adherence (86.8%), and currently exercising 3 days per week (25%). The two highest rated scales for exercise motivation were weight management (72.4%) and positive health (76.3%).

Table 1

Frequencies: Demographics, Type of Exercise, Level of Support, Readiness for Change,
Days Engaged in Exercise, and Motivation to Exercise (N = 76)

	N	*%*
Female	76	100
Between 20-39 years old	76	100
Type of Exercise		
Aerobic Exercise (0)	53	69.7
Anaerobic Exercise (1)	23	30.3
Level of Support		
0	1	1.3
1	7	9.2
2	13	17.1
3	23	30.3
4	17	22.4
5	15	19.7
Readiness for Change		
No (0)	10	13.2
Yes (1)	66	86.8
Days Engaged in Exercise		
0	0	0
1	4	5.3
2	11	14.5
3	19	25.0
4	16	21.1
5	14	18.4
6	7	9.2
7	5	6.6
Motivation to Exercise		
Stress management		
0 (Low)	6	7.9
1 (Medium)	38	50.0
2 (High)	32	42.1
Revitalization		
0 (Low)	7	9.2
1 (Medium)	37	48.7
2 (High)	32	42.1
Challenge		
0 (Low)	18	23.7
1 (Medium)	49	64.5
2 (High)	9	11.8
Social recognition		
0 (Low)	46	60.5

(*table continues*)

1 (Medium)	26	34.2
2 (High)	4	5.3
Enjoyment		
0 (Low)	10	13.2
1 (Medium)	45	59.2
2 (High)	21	27.6
Appearance		
0 (Low)	7	9.2
1 (Medium)	34	44.7
2 (High)	35	46.1
Weight management		
0 (Low)	4	5.3
1 (Medium)	17	22.4
2 (High)	55	72.4
Affiliation		
0 (Low)	46	60.5
1 (Medium)	25	32.9
2 (High)	5	6.6
Health Pressures		
0 (Low)	51	67.1
1 (Medium)	21	27.6
2 (High)	4	5.3
Positive Health		
0 (Low)	1	1.3
1 (Medium)	17	22.4
2 (High)	58	76.3
Ill-health avoidance		
0 (Low)	4	5.3
1 (Medium)	32	42.1
2 (High)	40	52.6
Competition		
0 (Low)	53	69.7
1 (Medium)	16	21.1
2 (High)	7	9.2
Strength and endurance		
0 (Low)	4	5.3
1 (Medium)	33	43.4
2 (High)	39	51.3
Nimbleness		
0 (Low)	13	17.1
1 (Medium)	45	59.2
2 (High)	18	23.7

Results

Preliminary Analysis

After collecting the data through SurveyMonkey, I uploaded the data to Microsoft Excel to review them for errors or missing data. Twenty-four respondents did not complete all the survey questions; these participants' responses were eliminated from the study. Six other participants were eliminated: the respondent who noted he was not female, the woman who indicated she had previously completed the survey, and the four who indicated they did not engage in aerobic or anaerobic exercise. Thus, 76 participants qualified for the study. I then calculated EMI-2 scores in Excel. Means for each scale were coded as 0 (0.0–1.9 = low), 1 (2.0–3.9 = medium), and 2 (4.0–5.0 = high). Aerobic exercise was coded as 0 and anaerobic exercise as 1. Readiness for change answers of *no* were coded as 0 and answers of *yes* were coded as 1. After I collected the data and input it into SPSS, frequencies were calculated to determine if any errors were present or if any data were missing. No errors or missing data were found.

Research Question 1 Preliminary Results

After I checked the frequencies in SPSS, tests of regression assumptions were performed for each of the research questions. A preliminary analysis was calculated to determine if the assumptions of the multiple regression were met for RQ1, which included normality of the standardized residuals, linearity, and homoscedasticity. For RQ1, independent variables of type of exercise (anaerobic vs. aerobic exercise), access to social support, readiness for change and the dependent variable of daily exercise

adherence were assessed. The results of the histogram of the regression standardized

residuals indicate the distribution was relatively normal (see Figure 1).
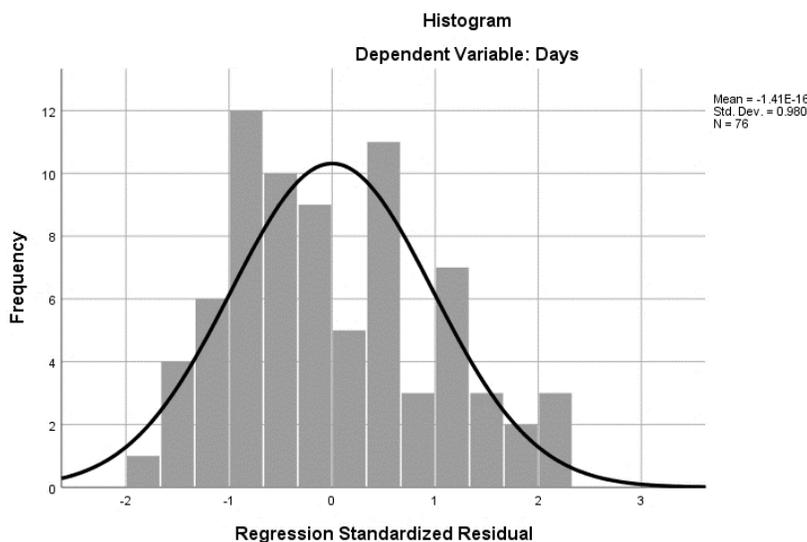
Figure 1. Histogram of the standardized residuals displays a relatively normal
distribution.

The Shapiro-Wilk test results determined p values for the following independent

variables: aerobic exercise (0.029) and anaerobic exercise (0.160); not ready to change

(0.038) and ready to change (0.003); support level 1 (0.262), support level 2 (0.294),

support level 3 (0.081), support level 4 (0.177), and support level 5 (0.279). Thus, the

independent variables of aerobic exercise and not ready to change did violate the

assumption of normality, indicating data significantly deviated from a normal

distribution. All other independent variables did not violate the assumption of normality,

as they were all greater than 0.05.

The scatterplot of the regression standardized residuals and the regression standardized predictive values displayed no observed violations in either homoscedasticity or linearity (see Figure 2). I also checked multicollinearity and found it to be not violated. I then computed variable inflation factor (VIF) for each independent variable. The VIF for independent variables was as follows: type of exercise = 1.049, readiness for change = 1.029, and level of support = 1.020. Each of the independent variables was less than 10, indicating the assumption of multicollinearity was low.
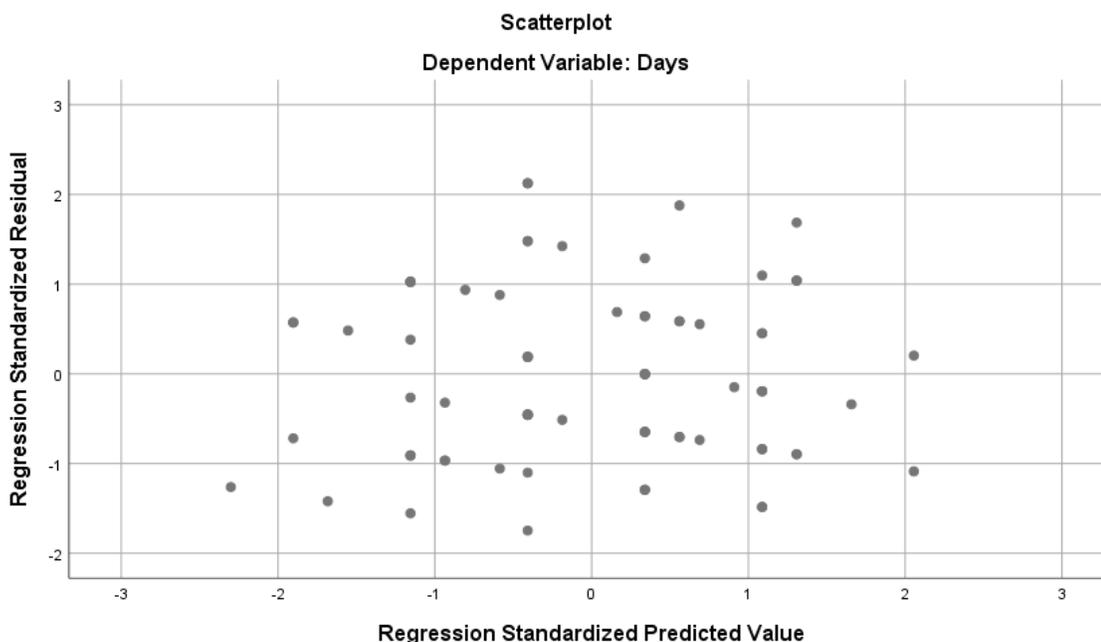
Figure 2. Plot of the standardized residuals and standardized predicated values. No violation in the assumptions of either linearity or homoscedasticity were found as the scatterplot pattern was rectangular in shape.

Research Question 2 Preliminary Results

For RQ2, independent variables of level of social support and motivation to exercise, and dependent variable of daily exercise adherence were assessed. Preliminary

analysis results for RQ2 indicated results of the histogram of the regression standardized

residuals indicate the distribution was relatively normal in shape. Thus, assumption of

normal distribution was not violated (see Figure 3).
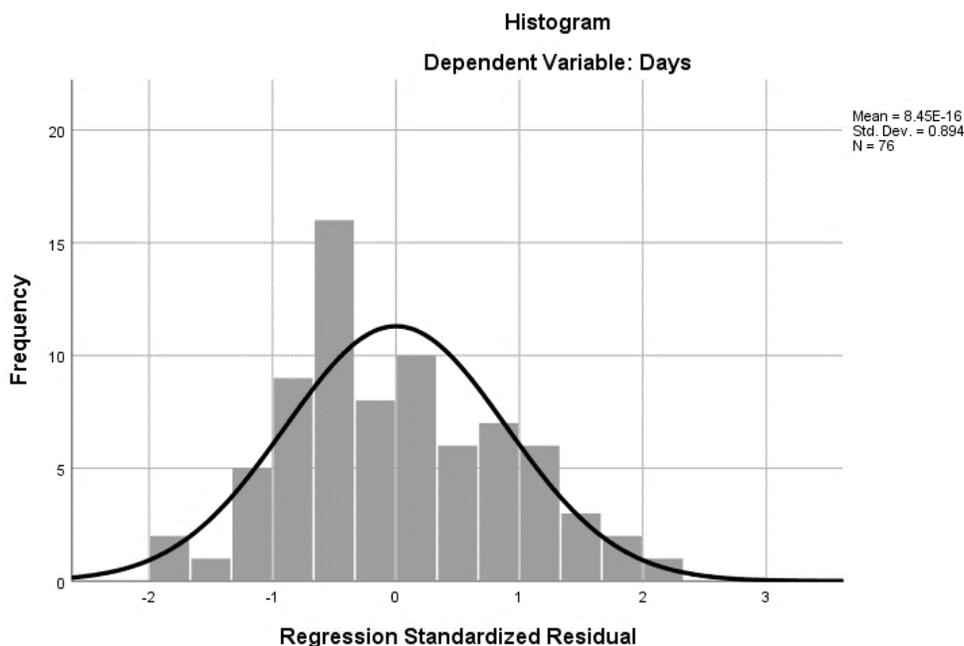
Figure 3. Histogram of the standardized residuals displays a relatively normal
distribution.

The Shapiro-Wilk test indicated *p* values are indicated in Table 2. Independent

variables of stress management (medium), revitalization (medium), enjoyment (medium),

challenge (medium), social recognition (low and high), affiliation (low, high),

competition (low), health pressures (low, medium, high), positive health (medium, high),

weight management (low, medium, high), strength and endurance (medium, high), and

nimbleness (low, medium, high) did violate the assumption of normality indicating data

significantly deviate from a normal distribution as they were both under 0.05. All other

independent variables did not violate the assumption of normality as they were all above

0.05.

Table 2

P values for Independent Variables: Level of Support, Motivation to Exercise, Readiness to Change

Level of Support
 Support level 1 (0.262)

 Support level 2 (0.294)

 Support level 3 (0.081)

 Support level 4 (0.177)

 Support level 5 (0.279)

Motivation to Exercise	Low	Medium	High
Stress management	0.466	0.005	0.071
Revitalization	0.224	0.001	0.124
Enjoyment	0.234	0.006	0.065
Challenge	0.136	0.001	0.160
Social recognition	0.036	0.139	0.024
Affiliation	0.013	0.109	0.238
Competition	0.010	0.667	0.062
Health pressures	0.029	0.027	0.024
Ill-health avoidance	0.572	0.058	0.087
Positive health	Omitted	0.034	0.019
Weight management	0.272	0.042	0.009
Appearance	0.72	0.073	0.146
Strength and endurance	0.406	0.014	0.021
Nimbleness	0.213	0.032	0.047

(*table continues*)

<u>Readiness for Change</u>

Not ready (0.038)	Ready to change (0.003)

The scatterplot of the regression standardized residuals and the regression standardized predictive values displayed no violations in either homoscedasticity or linearity (see Figure 4).
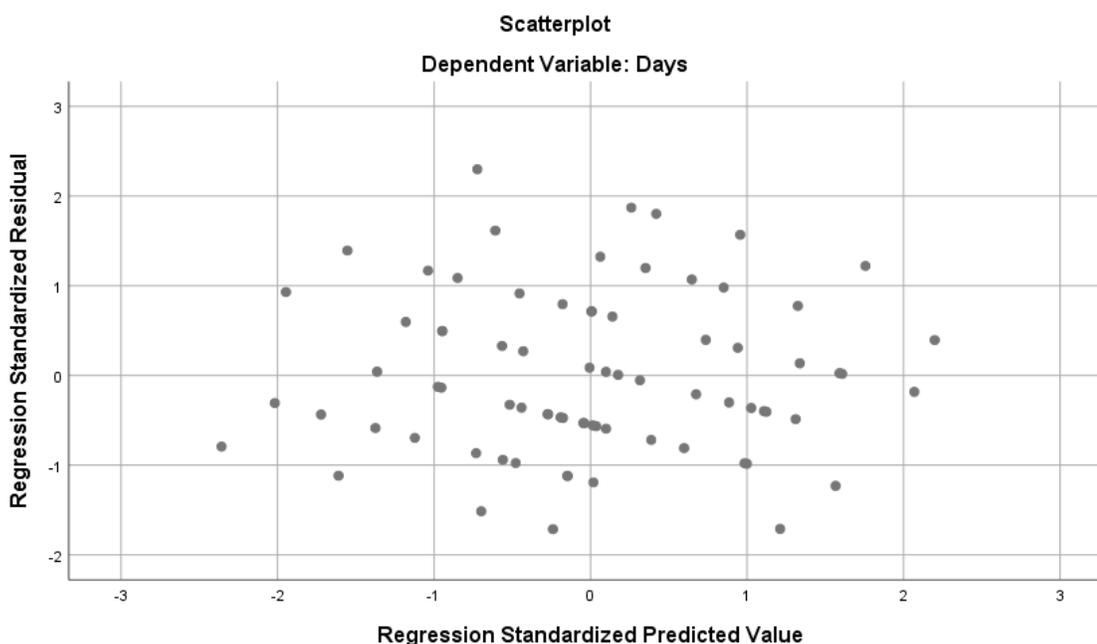
Figure 4. Plot of the standardized residuals and standardized predicated values. No violation in the assumptions of either linearity or homoscedasticity were found as the scatterplot pattern was rectangular in shape.

The VIF for each of the independent variables are as follows: level of support = 1.312, stress management = 1.588, revitalization = 3.259, enjoyment = 2.589, challenge = 2.227, social recognition = 2.311, affiliation = 1.592, competition = 1.751, health pressures = 1.621, ill-health avoidance = 2.632, positive health = 2.518, weight

management = 2.007, appearance = 1.918, strength and endurance = 2.820, and

nimbleness = 1.627. All VIFs were under 10, indicating the assumption of

multicollinearity is low.

Research Question 3 Preliminary Results

For RQ3, independent variables of type of motivation to exercise and readiness to

change, and dependent variable of daily exercise adherence were assessed. Results of the

histogram of the regression standardized residuals indicated the distribution was

relatively normal, indicating normal distribution was not violated (see Figure 5).
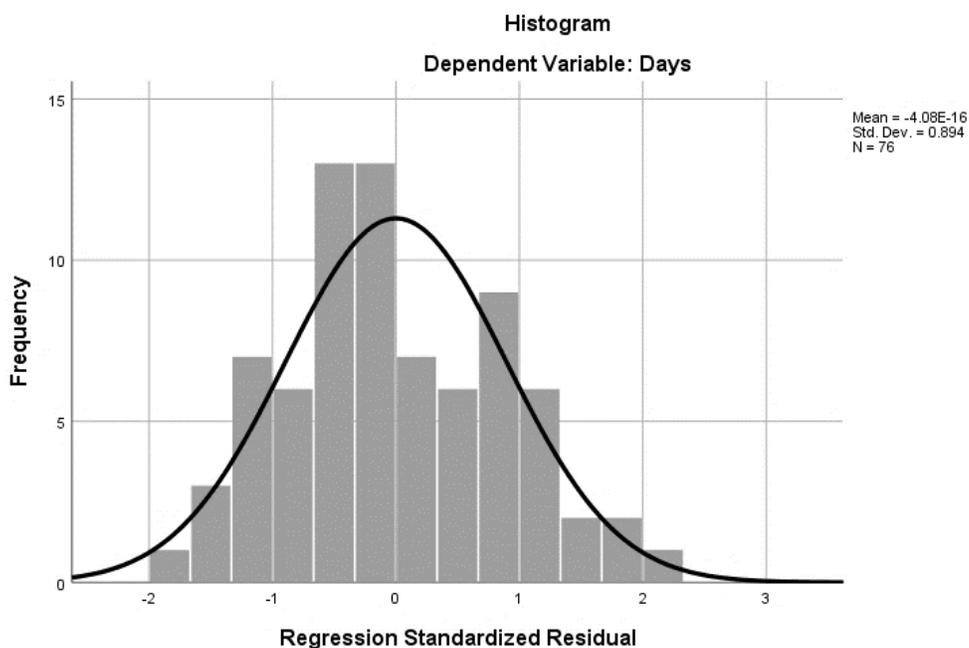
Figure 5. Histogram of the standardized residuals displays a relatively normal
distribution.

The Shapiro-Wilk test indicated *p* values are indicated in Table 2. The

independent variables of stress management (medium), revitalization (medium),

enjoyment (medium), challenge (medium), social recognition (low and high), affiliation (low, high), competition (low), health pressures (low, medium, high), positive health (medium, high), weight management (low, medium, high), strength and endurance (medium, high), nimbleness (low, medium, high), readiness to change (not ready to change, ready to change) did violate the assumption of normality indicating data significantly deviate from a normal distribution as they were both under 0.05. All other independent variables did not violate the assumption of normality as they were all above 0.05.

The scatterplot of the regression standardized residuals and the regression standardized predictive values displayed no violations in either homoscedasticity or linearity (see Figure 6).
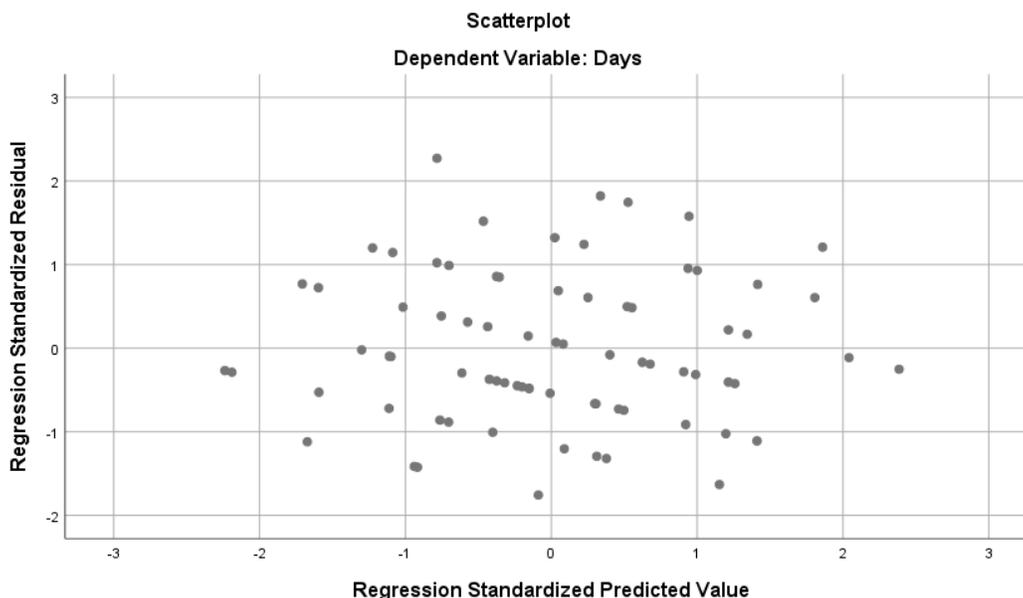
Figure 6. Plot of the standardized residuals and standardized predicated values. No violation in the assumptions of either linearity or homoscedasticity were found as the scatterplot pattern was rectangular in shape.

Main Analysis

I conducted multiple regression to determine if anaerobic versus aerobic exercise, access to social support, and readiness for change affect the daily exercise adherence. Independent variables were anaerobic vs. aerobic exercise, access to social support, and readiness for change. Type of exercise was determined by answers of either aerobic or anaerobic exercise (coded as 0 = aerobic exercise and 1 = anaerobic exercise) and the mean was 0.30 ($SD = 0.462$), readiness for change was determined by no or yes answers (coded as no = 0 and yes = 1) and the mean was 0.87 ($SD = 0.340$), access to social support was scored on a scale of 0 to 5 where lower answers represented less support and higher scores represented high levels of support and the mean was 3.22 ($SD = 1.282$). The dependent variable was daily exercise adherence where scores ranged from 0 days per week to 7 days per week. The mean for daily exercise adherence was 3.87 ($SD = 1.569$).

The multiple regression indicated the model was not a significant predictor of daily exercise adherence, $F(3,72) = 1.640$. The relationship tested is true and the model is robust. There was no significant linear relationship between type of exercise (i.e. anaerobic vs aerobic) and daily exercise adherence, $\beta = 0.113$, $p = 0.336$. There was a significant linear relationship between level of support and daily exercise adherence, $\beta = 0.242$, $p = 0.039$. There was no significant linear relationship between readiness for change and daily exercise adherence, $\beta = 0.034$, $p = 0.768$.

This model explains 2.5% of the variance in daily exercise adherence at the 95% confidence interval, and this is statistically significant at $\alpha = 0.05$. Level of support is

positively associated with daily exercise adherence such that, adjusting for the other

variables in the model, for each additional level of support, the natural log of daily

exercise adherence is predicted to increase by 0.297 days, and this association is

statistically significant ($p = 0.039$). None of the other variables in the model were

significantly associated with daily exercise adherence (see Tables 3 and 4).

Table 3

ANOVA Table: Anaerobic vs. Aerobic Exercise, Access to Social Support, and Readiness for Change Regressed on Daily Exercise Adherence

Model	SS	df	MS	F	p
Regression	11.815	3	3.938	1.640	.188
Residual	172.869	72	2.401		
Total	184.684	75			

Table 4

Anaerobic vs Aerobic Exercise, Access to Social Support, and Readiness for Change Regressed on Daily Exercise Adherence

Model	Unstandardized coefficients		Standardized coefficients		
	B	SE	β	t	p
(Constant)	2.658	.713		3.373	.000
Type	384	.396	.113	.969	.336
Support	.297	.141	.242	2.105	.039
Ready	.158	.533	.034	.296	.768

I performed a second multiple regression to determine if motivation to exercise interacts with social support to predict daily exercise adherence. The first independent variable, access to social support, was scored on a scale of 0 to 5 where lower answers represented less support and higher scores represented high levels of support and the mean was 3.22 ($SD = 1.282$). The second independent variable was motivation to exercise and each of the 14 scales of motivation was rated 0 to 3 where 0 indicated a low amount, 1 indicated a medium amount, and 2 indicated a high amount. The means and standard deviations for the various scales of the EMI-2 were calculated (see Table 5). The dependent variable once again was daily exercise adherence where scores ranged from 0 days per week to 7 days per week. The mean for daily exercise adherence was 3.87 ($SD = 1.569$).

At the 95% confidence interval, the multiple regression indicated the model was not a significant predictor of daily exercise adherence, $F(15, 60) = 0.945$. The relationship tested is true and the model is robust. No variables in the model were significantly associated with daily exercise adherence (see Tables 6 and 7).

Table 5

Means and Standard Deviations Table for the EMI-2 Scales

Scale	*M*	*SD*
Stress Management	1.34	.623
Revitalization	1.33	.641
Enjoyment	1.14	.626
Challenge	.88	.588
Social Recognition	.45	.598
Affiliation	.46	.621
Competition	.39	.655
Health Pressures	.38	.588
Ill-health Avoidance	1.47	.599
Positive Health	1.75	.465
Weight Management	1.67	.575
Appearance	1.37	.650
Strength and Endurance	1.46	.599
Nimbleness	1.07	.639

Table 6

ANOVA Table: *Motivation to Exercise Regressed on Social Support*

Model	*SS*	*df*	*MS*	*F*	*p*
Regression	35.298	15	2.353	.945	.522
Residual	149.387	60	2.490		
Total	184.684	75			

Table 7

Motivation to Exercise Regressed on Social Support

Model	Unstandardized coefficients		Standardized coefficients		
	B	*SE*	β	*t*	*p*
(Constant)	3.417	.981		3.483	.001
Support	.213	.163	.174	1.308	.196
Nimbleness	-.174	.363	-.071	-.479	.634
Strength Endurance	-.322	.511	-.123	-.630	.531
Appearance	-.106	.388	-.044	-.274	.785
Weight Management	-.502	.449	-.184	-1.118	.268
Positive Health	-.027	.621	-.008	-.043	.966
Ill-Health Avoidance	.357	.493	.136	.723	.472
Health Pressures	.359	.394	.135	.910	.366
Competition	.050	.368	.021	.135	.893
Affiliation	-.444	.370	-.176	-1.199	.235
Social Recognition	-.051	.463	-.020	-.111	.912
Challenge	.630	.462	.236	1.362	.178
Enjoyment	.284	.468	.113	.606	.547
Revitalization	-.183	.513	-.075	-.356	.723
Stress Management	.268	.369	.107	.728	.469

I performed the final multiple regression to determine if motivation to exercise interacts with readiness to change to predict daily exercise adherence. The multiple regression indicated the model was not a significant predictor of daily exercise adherence, $F(15, 60) = 0.808$ at the 95% interval. The relationship tested is true and the model is robust. None of the variables in the model were significantly associated with daily exercise adherence (see Tables 8 and 9).

Table 8

ANOVA Table: Motivation to Exercise Regressed on Readiness to Change

Model	SS	df	MS	F	p
Regression	31.044	15	2.070	.808	.664
Residual	153.640	60	2.561		
Total	184.684	75			

Table 9

Coefficients Table: Motivation to Exercise Regressed on Readiness to Change

	Unstandardized coefficients			Standardized coefficients		
Model	B	SE	β	t	p	
(Constant)	3.917	.974		4.023	.000	
Ready	.037	.670	.008	.055	.956	
Nimbleness	-0.252	0.364	-0.103	-0.693	0.491	
Strength Endurance	-0.176	0.513	-0.067	-0.343	0.733	
Appearance	-0.119	0.400	-0.049	-0.297	0.768	
Weight Management	-0.397	0.448	-0.145	-0.885	0.379	
Positive Health	-0.116	0.642	-0.034	-0.181	0.857	
Ill-Health Avoidance	0.284	0.502	0.109	0.566	0.574	
Health Pressures	0.326	0.400	0.122	0.816	0.418	
Competition	0.167	0.372	0.070	0.449	0.655	
Affiliation	-0.497	0.374	-0.196	-1.329	0.189	
Social Recognition	-0.179	0.460	-0.068	-0.390	0.698	
Challenge	0.583	0.510	0.218	1.143	0.258	
Enjoyment	0.287	0.477	0.115	0.602	0.549	
Revitalization	-0.063	0.537	-0.026	-0.117	0.907	
Stress Management	0.310	0.382	0.123	0.810	0.421	

Summary

Three research questions were assessed. In RQ1, I measured if anaerobic versus aerobic exercise, access to social support, and readiness for change impact the daily exercise adherence. The multiple regression indicated only level of support positively affects daily exercise adherence. In RQ2, I assessed if motivation to exercise, as measured by the EMI-2, interacts with social support to predict daily exercise adherence. The multiple regression indicated motivation to exercise interacting with level of social support does not predict daily exercise adherence. In RQ3, I assessed if motivation to exercise, as measured by the EMI-2, interacts with readiness to change to predict daily exercise adherence. The results of the multiple regression indicated motivation to exercise interacting with readiness to change does not predict daily exercise adherence.

In the next chapter, an overview of the research study, summary of the findings, and interpretations will be discussed. In addition, I offer recommendations about further actions and additional research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to improve the understanding of motivational factors that lead women in the United States ages 20–39 years old to incorporate exercise into their daily lives. All 76 participants were women ages 20–39 years old, lived in the United States, and engaged in regular anaerobic or aerobic exercise. I collected data from an online survey that comprised four original questions and the EMI-2. I assessed three research questions.

Research Question 1 (RQ1): Do the independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) impact the dependent variable (daily exercise adherence)?

Null Hypothesis ($H_0$1): Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do not impact the dependent variable (daily exercise adherence).

Alternative Hypothesis (H_a1): Independent variables (i.e., anaerobic vs. aerobic exercise, access to social support, and readiness for change) do impact the dependent variable (daily exercise adherence).

In RQ1, I measured if anaerobic versus aerobic exercise, access to social support, and readiness for change impact the daily exercise adherence. The multiple regression indicated only level of support positively affects daily exercise adherence. The null hypnosis was rejected, as only one independent variable in the research question, level of support, affected daily exercise adherence.

Research Question 2 (RQ2): Does motivation to exercise interact with social support to predict daily exercise adherence?

Null Hypothesis ($H_0$2): Motivation to exercise does interact with level of social support to predict daily exercise adherence.

Alternative Hypothesis (H_a2): Motivation to exercise does not interact with level of social support to predict daily exercise adherence.

In RQ2, I assessed if motivation to exercise, as measured by the EMI-2, interacts with social support to predict daily exercise adherence. The multiple regression indicated motivation to exercise interacting with level of social support does not predict daily exercise adherence. The null hypothesis was rejected.

Research Question 3 (RQ3): Does motivation to exercise interact with readiness to change to predict daily exercise adherence?

Null Hypothesis ($H_0$3): Motivation to exercise and readiness for change interact with each other to predict daily exercise adherence.

Alternative Hypothesis (H_a3): Motivation to exercise and readiness for change do not interact with each other to predict daily exercise adherence.

In RQ3, I assessed if motivation to exercise, as measured by the EMI-2, interacts with readiness to change to predict daily exercise adherence. The results of the multiple regression indicated motivation to exercise interacting with readiness to change does not predict daily exercise adherence. The null hypothesis was rejected.

This chapter will include an interpretation of the findings, limitations of this study, recommendations, and implications. The chapter also includes a conclusion.

Interpretation of the Findings

The literature review served as the background of this study. Only about 22% of the United States population regularly engages in exercise (Iso-Ahola & Miller, 2016). Only 18% of women meet the "moderate" activity level of at least 150 minutes of exercise each week recommended by the CDC (2019). Limited research has focused on readiness for change to determine success with a healthier lifestyle in terms of implementing daily exercise into a woman's lifestyle (Byom & Sapp, 2013; Dinger et al., 2007; Johnson et al., 2008; Findorff et al., 2007; Yang et al., 2015). The present study indicated that 86.8% of participants were ready to implement change in daily exercise adherence. When asked how many days per week participants engaged in exercise, the plurality (25%) of participants indicated 3 days per week; only 6.6% of participants indicated exercising 7 days per week. Participants indicated they engaged in aerobic exercise (69.7%) or anaerobic exercise (30.3%).

Exercising is the activity with the greatest effect on improving a person's overall health (Bassuk et al., 2013). Women who are dissatisfied with their current body structure, weight, or body mass index (BMI) have been found to be more concerned about health and losing weight than female counterparts who are satisfied with their current body structure, weight, or BMI (Melbye et al., 2008). Participants in the present study indicated on the EMI-2 that the top three reasons for exercise motivation were positive health (76.3%), weight management (72.4%), and ill-health avoidance (52.6%).

No normative data on women ages 20–39 years old who were administered the EMI-2 were available with which to compare prior research results. The results of the

present study confirm prior research (Al-Eisa et al., 2016; Chu et al., 2008; Kulavic, Hultquist, & McLester, 2013; Earnest et al., 2012; Melbye et al., 2008) of women of various age groups who regularly engaged in exercise programs for health management.

In the absence of normative data for the specific population being studied, the results of this study were compared to two prior studies involving women ages 20–39 years old who were administered the EMI-2. In a study by Al-Eisa et al. (2016), female college students ages 19–22 years old were given the EMI-2 to determine exercise motivation. Results of the study determined the top three reasons for exercise motivation were positive health, ill-health avoidance, and weight management. The second study was performed on non-traditional, female college students ages 18–34 years old (Kulavic et al., 2013). When this population of women were given the EMI-2, the top reasons for exercise motivation were positive health, ill-health avoidance, and strength and endurance. In each of the three studies, exercise motivation was assessed in women by administering the EMI-2. In the results of the present study and the studies by Al-Eisa et al. (2016) and Kulavic et al. (2013), females indicated positive health and ill-health avoidance as the top reasons for exercise motivation.

Researchers have found that women who reported having positive support systems, including friends, family members, medical staff, and other people struggling with changing negative behaviors, were more inclined to participate in exercise (Kanning, 2010; Van Dyck et al., 2014; Velicer et al., 1998; Wang et al., 2014). Access to positive support systems can also affect a woman's progress toward a healthier lifestyle, such as implementing exercise into her daily life (Macchi, 2013; Sorkin, 2014;

Vallerand & Young, 2014). Participants in the present study confirmed these findings and indicated level of support positively affected daily exercise adherence.

There was no relationship between type of exercise, readiness to change, motivation to exercise, and daily exercise adherence nor an interaction between level of support and motivation to exercise with daily exercise adherence. In addition, there was no significant interaction between readiness to change with motivation to exercise and daily exercise adherence.

TM posits that individuals move through five stages when deciding to engage in behaviors intended to increase overall health and well-being: precontemplation, contemplation, preparation, action, and maintenance (Prochaska et al., 1994). TM has five cognitive-affective components, including consciousness raising, dramatic relief, environmental reevaluation, self-reevaluation, and social liberation, as well as five behavioral components: reinforcement management, counterconditioning, helping relationships, self-liberation, and stimulus control (Baumann et al., 2013). In the present study, one of the prequalification questions asked if the respondent engaged in regular exercise. Those who answered yes were admitted into the study because they had already passed through the first three stages of TM. Thus, the research questions were focused on the two latter stages of TM, action and maintenance.

For RQ1, TM suggested readiness for change and the behavioral component of social support would have a higher likelihood to positively affect daily exercise adherence. The results of RQ1 confirmed that only the level of social support positively affected daily exercise adherence. Type of exercise (aerobic vs. anaerobic) and readiness

for change did not affect daily exercise adherence. Based on TM, it was expected that motivation to change interacting with access to social support would affect daily exercise adherence. However, the interaction between motivation to change and access to social support was not significantly associated with daily exercise adherence. Finally, based on TM, it was expected that motivation to change interacting with readiness to change would affect daily exercise adherence. However, the results of RQ3 did not support this theory. The interaction between motivation to change and readiness to change was not significantly associated with daily exercise adherence.

One possible reason why the results of this study did not conform to what was expected was the effect size of independent variables on the dependent variable. When the power analysis was conducted to determine the required sample size, a medium effect size was used as the basis, as it is the idea effect size for scientific research studies (Cohen 1988). Based on the assumption the multiple regression will have three independent variables, a .15 effect size (medium effect size), alpha level of .05, and power of .95, the minimum sample size needed for this particular study was 89. A total of 105 women completed the survey; however, only 76 respondents were included in the final analyses of the study.

The results of the multiple regression, where independent variables of type of exercise, access to social support, and readiness to change were used to predict daily exercise adherence (RQ1), indicated that the effect of the independent variables to predict daily exercise adherence was small (R^2=.025). Cohen (1988) posed that an R^2 of .02 or 2% is considered a small effect, .06 or 6% is a medium effect, and .14 or 14% or higher is

a large effect. A post-hoc power analysis, based on a sample size of 76, an effect size of .222, and a p-value of .896, produced an observed power of .066, which is well below the accepted threshold of 80% used in the social sciences field (Field, 2012). This means that, based on the sample size of 76 and the effect size of ($R2$=.222 or 22.2%), there was only a 6.6% chance of detecting a significant effect if one exists in the real world. As mentioned before, 80% is the standard for likelihood of detectability in the social sciences (Field, 2012). So, if type of exercise, access to social support, and readiness to change were used to predict daily exercise adherence, it is highly unlikely that it would be detected from this particular study.

A post-hoc power analysis, based on a sample size of 76 and an effect size of .540, the following *p*-values and observed powers were found: stress management (*p*-value=.324, observed power=.241), revitalization (*p*-value=.116, observed power=.435), enjoyment (*p*-value=.395, observed power=.204), challenge (*p*-value=.768, observed power=.089), social recognition (*p*-value=.358, observed power=.222), affiliation (*p*-value=.632, observed power=.121), competition (*p*-value=.974, observed power=.054), health pressures (*p*-value=.531, observed power=.151), ill health avoidance (*p*-value=.151, observed power=.386), positive health (*p*-value=.521, observed power=.154), weight management (*p*-value=.028, observed power=.670), appearance (*p*-value=.784, observed power=.086), strength and endurance (*p*-value=.114, observed power=.439), nimbleness (*p*-value=.659, observed power=.114), and support (*p*-value=.373, observed power=.353). This means that based on the sample size of 76 and the effect size of ($R2$=.540 or 54%), weight management has the highest probability of 67% in detecting a

significant effect if one exists in the real world. Even at 67%, this is below the industry standard of 80% (Field, 2012). Therefore, if motivation to exercise interacting with social support were used to predict daily exercise adherence, it is highly unlikely that it would be detected from the current study.

Past researchers (Melbye et al., 2008; Macchi, 2013; Sorkin, 2014; Van Dyck et al., 2014) found that women engage in exercise due to weight management and had higher levels of exercise adherence in correlation with higher levels of access to social support. Thus, I initially hypothesized for this study that motivation to exercise interacting with social support would be a significant predictor of daily exercise adherence. Results of this study show that the independent variables of motivation to exercise interacting with social support were not a significant predictor of daily exercise adherence in women ages 20–39 years old. This may be due to two possibilities. The first possibility is that the research hypothesis was not confirmed due to overfitting, also referred to as the high-dimensional low sample size setting (Subramanian & Simon, 2013). In regression models such as the present study, overfitting occurs when there are too many terms being measured for the number of observations collected (Babyak, 2004; Frost, 2019). When overfitting occurs in a study, the results of the study do not accurately represent the entire population being studied and only represent the sample collected (Babyak, 2004). To avoid overfitting, it is recommended to have a sample size 10 times the number of factors being studied (Subramanian & Simon, 2013). The present study included 15 factors: the 14 scales from the EMI-2 as well as the independent variable level of social support. Increasing the sample size (Babyak, 2004) to 150 to account for

the 15 factors being studied in addition to collecting additional surveys may confirm that motivation to exercise interacting with social support is a significant predictor of daily exercise adherence in women ages 20–39 years old. Second is the wording of the research question. The research question requires the independent variables of motivation to exercise and social support to have an interaction with one another. By rewording the research question to not require an interaction between the two independent variables, and instead examining the variables independently, it may confirm that the independent variables of motivation to exercise and social support are both significant predictors of daily exercise adherence.

Previous researchers have not directly tested the interaction between motivation to exercise and access to social support in women ages 20–39 years old. Results confirm the current research indicating higher levels of social support and weight management, when examined separately, are predictors of daily exercise adherence (Melbye, 2008; Macchi, 2013; Sorkin, 2014; Van Dyck et al., 2014).

A post-hoc power analysis, based on a sample size of 76 and an effect size of .497, the following p-values and observed powers were found: readiness for change (*p*-value=.222, observed power=.228), stress management (*p*-value=.216, observed power=.318), revitalization (*p*-value=..062, observed power=.547), enjoyment (*p*-value=.393, observed power=.205), challenge (*p*-value=.297, observed power=.258), social recognition (*p*-value=.331, observed power=.237), affiliation (*p*-value=.409, observed power=.198), competition (*p*-value=.914, observed power=.063), health pressures (*p*-value=.904, observed power=.065), ill health avoidance (*p*-value=.141,

observed power=.400), positive health (*p*-value=.346, observed power=.229), weight

management (*p*-value=.003, observed power=.896), appearance (*p*-value=.368, observed

power=.217), strength and endurance (*p*-value=.051, observed power=.581), nimbleness

(*p*-value=.861, observed power=.072). This means that based on the sample size of 76

and the effect size of (R2=.497 or 49.7%), weight management has the highest

probability of 89.6% in detecting a significant effect if one exists in the real world. At

89.6%, this meets the industry standard of 80% (Field, 2012). These results indicate that

weight management is extremely perceptible as a definitive motivational factor for the

women in this study to determine exercise motivation. If these results were applied to

other populations of women ages 20–39 years old in the United States, it is highly likely

that weight management would be the top reason for exercise motivation. These findings

confirm prior research indicating women are motivated to exercise due to weight

management (Byom & Sapp, 2013; King, 2013; Macchi et al., 2013; Melbye et al., 2008;

Nagel, Sonnentag, & Kühnel, 2015; Stoltz et al., 2009).

Limitations of the Study

Two limitations were discussed in Chapter 1. First, the survey along with four

additional questions, had not previously been used to evaluate levels of exercise

motivation in women ages 20–39 years old, and therefore, no comparison was possible. A

second limitation was that participants may have answered questions incorrectly or in

ways they thought were more socially acceptable rather than truthfully answer. After the

study was finished, one additional limitation was determined. The third limitation was

that participation in the study was limited to females in the United States ages 20–39

years old and therefore, the results of this study may not be generalized to other age populations.

First, the survey, which comprised the EMI-2 and four additional questions, had not been used previously to evaluate levels of exercise motivation in women ages 20–39 years old. Thus, no normative data were available to compare results from this study. Second, participants may have answered questions incorrectly or in ways they thought were more socially acceptable rather than truthful. To prevent this from occurring, participants were told that all surveys would be confidential and no personal information would be collected. Data were collected through an online survey created on SurveyMonkey.com, which assigned participants an identification number to ensure no personal information was collected. Third, participation in the study was limited to females in the United States ages 20–39 years old. Because of the specific gender, age group, and geographic location, results of this particular study cannot be generalized to other populations. Samples of various other age groups may have provided different answers.

Recommendations

The study determined that only level of support affects daily exercise adherence. That is, the more social support reported, the greater daily exercise adherence. One reason for this is the wording of RQ2 and RQ3 addressed only whether the two independent variables interacted with one another to determine daily exercise adherence. In future studies in this area, each independent variable should be assessed on its own to determine if there is a correlation with daily exercise adherence because the current study

assessed whether the two independent variables interacted with one another to determine

daily exercise adherence. Results were not able to prove two independent variables

interacting with one another were able to determine daily exercise adherence. If each

independent variable was assessed on its own in a future study, it may possibly determine

if each independent variable determines increased daily exercise adherence.

A second recommendation is that future researchers should examine the extent to

which the score on each of the individual EMI-2 scales affects daily exercise adherence.

The proposed alteration to the research questions may reveal significant relationships

between motivation to exercise as assessed through the EMI-2 and predicted daily

exercise adherence.

A third recommendation is that future researchers should increase the number of

surveys collected. By increasing the number of surveys collected to 150, the possibility of

overfitting is decreased. This study utilized the EMI-2 to measure exercise motivation.

The EMI-2 has 14 scales to measure various types of exercise motivation. Due to the

amount of scales on the EMI-2 interacting with the additional independent variable level

of social support, the sample size collected in the present study may not be enough to

accurately represent the overall population of women ages 20–39 years old. As described

above, it is possible that increasing the number of surveys collected may provide

differing results and confirm the initial hypotheses for this study.

Implications

The potential impact for positive social change at the individual level for women

is that the information from this study may be used to increase awareness of the value of

positive social support with exercise adherence. The respondents in this study indicated

the only independent variable that positively affected the dependent variable was access

to social support. With increased social support, women ages 20–39 years old may be

able to implement sustainable daily exercise adherence. This can be achieved by a

woman evaluating the relationships in her life and determining which relationships are

positive and supportive and which relationships are negative and unsupportive. Once the

woman is aware, she can choose to spend more time with the positive influences and less

time with the negative influences.

The potential impact for positive social change at the family level is that women

can speak with loved ones to raise awareness of the importance of positive social

supports in the implementation of increasing daily exercise adherence. This can be

achieved by women discussing plans of lifestyle change with their family to inform them

of potential changes in the household and to allow the family time to adjust to the

changes and be accepting of the changes.

On an organizational level, the potential impact for positive social change can be

achieved by organizations encouraging women to find other women to be accountability

partners and positive friends, while attempting to increase daily exercise adherence. For

example, if women are in group fitness classes, the leader of the class could encourage

women to share their short-term exercise goals and long-term exercise goals. Then,

women who have similar goals can be accountability partners and keep one another on

track for implementing goals, thus providing the needed social support.

At the societal level, the results from this study may lead to positive social change by helping to increase daily exercise adherence in women ages 20–39 years old, thereby leading to lower the obesity levels. As previously mentioned, the obesity levels of women ages 20–39 years old in the United States increased by 13.3% over a 20-year period (Shields et al., 2011). Due to the results of this study, future clinicians may recommend females seek out positive social support to have a better chance of implementing exercise into a daily routine. Another recommendation is for clinicians to organize support groups for patients to participate in to have access to social support.

The results of this study may make a contribution to the scholarly literature on exercise and weight management, hopefully furthering the understanding of what works, and thereby eventually contributing to positive social change in women who are attempting to use exercise as a means to improve their weight management.

Findings from this study did not support my theory of type of exercise affecting daily exercise adherence or readiness for change affecting daily exercise adherence. Additional research is needed on these two motivational factors. This study also demonstrated a need to further increase the knowledge of additional motivational factors, such as those on the EMI-2, that lead to increased daily exercise adherence, and thus may possibly help to contribute to positive social change for females of all ages.

Conclusion

In this study, I sought to examine whether type of exercise, access to social support, readiness for change, and motivation to exercise were associated with increased exercise adherence in women ages 20–39 years old. The null hypotheses were that type

of exercise, access to social support, and readiness for change do not impact the daily exercise adherence, motivation to exercise does interact with level of social support to predict daily exercise adherence, and motivation to exercise and readiness for change interact with each other to predict daily exercise adherence. In all three instances, the null hypotheses were rejected.

Results of the study confirm prior research findings that women engage in exercise due to positive health, ill-health avoidance, and to control weight. In addition, women in the present study indicated positive social support affects daily exercise adherence. Therefore, to increase daily exercise adherence in women ages 20–39 years old, several recommendations based on the findings are proposed: increase positive personal relationships, increase positive social support, and increase participation in positive social support groups. Finally, women who are seeking motivation to increase daily exercise adherence should do so not only to control weight, but also to obtain positive health and avoid ill-health. In today's society the stresses of career, family & friendships on women ages 20–39 years old are enormous. By taking excellent care of their health with proper exercise, these women will hopefully be better equipped to overcome and rise above any challenges that life puts in their path.

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Appendix A: The Exercise Motivations Inventory–2 (EMI-2)

The Exercise Motivations Inventory - 2 (EMI-2)

On the following pages are a number of statements concerning the reasons people often give when asked why they exercise. *Whether you currently exercise regularly or not,* please read each statement carefully and indicate, by circling the appropriate number, whether or not each statement *is true* for you personally, *or would be true* for you personally if you did exercise. If you do not consider a statement to be true for you at all, circle the '0'. If you think that a statement is very true for you indeed, circle the '5'. If you think that a statement is partly true for you, then circle the '1', '2', '3' or '4', according to how strongly you feel that it reflects why you exercise or might exercise.

Remember, we want to know why *you personally* choose to exercise or might choose to exercise, not whether you think the statements are good reasons for *anybody* to exercise.

It helps us to have basic personal information about those who complete this questionnaire. We would be grateful for the following information:

Your age ………… years   **Your gender ……male/female**

	Not at all true for me					**Very true for me**
Personally, I exercise (or might exercise) …						
1 To stay slim	0	1	2	3	4	5
2 To avoid ill-health	0	1	2	3	4	5
3 Because it makes me feel good	0	1	2	3	4	5

4	To help me look younger	0	1	2	3	4	5
5	To show my worth to others	0	1	2	3	4	5
6	To give me space to think	0	1	2	3	4	5

	Not at all true for me				**Very true for me**

Personally, I exercise (or might exercise) …

7	To have a healthy body	0	1	2	3	4	5
8	To build up my strength	0	1	2	3	4	5
9	Because I enjoy the feeling of exerting myself	0	1	2	3	4	5
10	To spend time with friends	0	1	2	3	4	5
11	Because my doctor advised me to exercise	0	1	2	3	4	5
12	Because I like trying to win in physical activities	0	1	2	3	4	5
13	To stay/become more agile	0	1	2	3	4	5
14	To give me goals to work towards	0	1	2	3	4	5
15	To lose weight	0	1	2	3	4	5
16	To prevent health problems	0	1	2	3	4	5
17	Because I find exercise invigorating	0	1	2	3	4	5
18	To have a good body	0	1	2	3	4	5

19	To compare my abilities with other peoples'	0	1	2	3	4	5
20	Because it helps to reduce tension	0	1	2	3	4	5
21	Because I want to maintain good health	0	1	2	3	4	5
22	To increase my endurance	0	1	2	3	4	5
23	Because I find exercising satisfying in and of itself	0	1	2	3	4	5

	Not at all true for me			**Very true for me**

Personally, I exercise (or might exercise) …

24	To enjoy the social aspects of exercising	0	1	2	3	4	5
25	To help prevent an illness that runs in my family	0	1	2	3	4	5
26	Because I enjoy competing	0	1	2	3	4	5
27	To maintain flexibility	0	1	2	3	4	5
28	To give me personal challenges to face	0	1	2	3	4	5
29	To help control my weight	0	1	2	3	4	5
30	To avoid heart disease	0	1	2	3	4	5
31	To recharge my batteries	0	1	2	3	4	5
32	To improve my appearance	0	1	2	3	4	5
33	To gain recognition for my accomplishments	0	1	2	3	4	5

34	To help manage stress	0	1	2	3	4	5
35	To feel more healthy	0	1	2	3	4	5
36	To get stronger	0	1	2	3	4	5
37	For enjoyment of the experience of exercising	0	1	2	3	4	5
38	To have fun being active with other people	0	1	2	3	4	5

Please Turn Over

		Not at all true for me				**Very true for me**	

Personally, I exercise (or might exercise) …

39	To help recover from an illness/injury	0	1	2	3	4	5
40	Because I enjoy physical competition	0	1	2	3	4	5
41	To stay/become flexible	0	1	2	3	4	5
42	To develop personal skills	0	1	2	3	4	5
43	Because exercise helps me to burn calories	0	1	2	3	4	5
44	To look more attractive	0	1	2	3	4	5
45	To accomplish things that others are incapable of	0	1	2	3	4	5
46	To release tension	0	1	2	3	4	5

47	To develop my muscles		0	1	2	3	4	5
48	Because I feel at my best when exercising		0	1	2	3	4	5
49	To make new friends		0	1	2	3	4	5
50	Because I find physical activities fun, especially when competition is involved		0	1	2	3	4	5
51	To measure myself against personal standards		0	1	2	3	4	5

Thank you for completing this questionnaire

David Markland
SSHES, University of Wales, Bangor
Email: d.a.markland@bangor.ac.uk
January 1997

Appendix B: Petroski Permission

Statement of agreement   People

From: Rick Petroski
To: 'Victoria Wozniak'   >
Sent: Wednesday, September 6, 2017 9:26 PM
Subject: statement

To: Walden University

Date: September 6, 2017

RE: Victoria Wozniak
       Doctoral Student

This letter serves as my agreement for my psychological practice, Richard A. Petroski, Ph.D. & Associates, to provide a free debriefing session to participants of Victoria Wozniak's dissertation study. I understand that Victoria Wozniak will provide my agency's contact information to each participant in the event that debriefing is needed due to participation in her study.

Thank you,

Richard A. Petroski, Ph.D.

Contact Information-

I also attached a signed copy on my letterhead in case that is needed as well. Let me know if anything else is needed. - Rick

Wozniak....pdf

Appendix C: Petroski Permission 2

Richard A. Petroski, Ph.D.
Licensed Psychologist

To: Walden University

Date: September 6, 2017

RE: Victoria Wozniak
         Doctoral Student

This letter serves as my agreement for my psychological practice, Richard A. Petroski, Ph.D. & Associates, to provide a free debriefing session to participants of Victoria Wozniak's dissertation study. I understand that Victoria Wozniak will provide my agency's contact information to each participant in the event that debriefing is needed due to participation in her study.

Thank you,

Richard A. Petroski, Ph.D

Richard A. Petroski, Ph.D.

Appendix D: Markland Permission

Exercise Motivation Measurement

David Markland PhD C.Psychol

School of Sport, Health & Exercise Sciences
Bangor University

Welcome to my exercise motivation measurement website. Over a number of years we have developed and validated or adapted several instruments for measuring aspects of motivation from the perspective of Deci and Ryan's (1985) self-determination theory (SDT). These pages give information on the instruments and the facility to download them. You are welcome to use any of these measures in your own research.

Want to help us further refine our measures and deepen our understanding of exercise motivation? You can help by completing our online survey here:

Exercise Motivation Survey

Your participation will be very much appreciated.

The *Behavioural Regulation in Exercise Questionnaire* (BREQ) measures different forms of motivation for exercise based on Deci and Ryan's (1985, 1991) continuum conception of extrinsic and intrinsic motivation.

The *Exercise Motivations Inventory-2* (EMI-2) is a measure of participation motives or reasons for exercising. The *Exercise Motives and Gains Inventory* (EMGI) is a recent development that complements the EMI-2 to provide scales assessing perceived gains from exercise that correspond to the EMI-2 scales.

The *Perceived Environmental Supportiveness Scale* measures perceptions of the extent to which exercise professionals provide individuals with support for their psychological needs (i.e., autonomy support, structure and involvement).

The *Exercise Causality Orientations Scale* (ECOS) measures individual differences in the tendency to be autonomous, controlled or amotivated in exercise contexts and is derived from Deci and Ryan's Causality Orientations Theory.

The *Locus of Causality for Exercise Scale* is a short measure of the degree to which individuals feel self-determined with respect to exercise.

Finally, although it is derived from a different theoretical perspective than SDT, we include here a measure of task and ego goal orientations for exercise contexts, the *Goal Orientations in Exercise Measure*.

The instruments are available for downloading as either .pdf files or MS Word documents.

On obtaining permission to use the scales

This is simple. If you are using the scales for research purposes you do not have to ask for permission! You are free to use the scales, adapt them, translate them or do whatever you like with them, provided, of course, that any publications that ensue include appropriate citations to their source. Students are also free to use the scales for projects, assignments and so on without having to ask for permisssion. If you translate any of the scales into other language versions I would be pleased upload them to this site for others to use. If you want to do this, please send me the

From http://pages.bangor.ac.uk/~pes004/exercise_motivation/scales.htm

Appendix E: SurveyMonkey.com Survey

Dissertation Survey

Welcome to Victoria Wozniak's Doctoral Dissertation Research Study

Thank you for participating in my survey. Your feedback is important.

You are invited to participate in this study because you are a female, age 20 to 39 years old, exercise regularly, and are a member of a Facebook group focusing on females and fitness. According to a study done in 2011 by Shields, Carroll, and Ogden, the population of women aged 20-39 has seen the largest rise in obesity over the last 20 years. Due to these findings, the study you are been invited to participate in will focus on exercise motivation through the use of completing an online survey. The survey will take approximately 30 minutes to complete. It consists of a total of 55 multiple choice questions about exercise motivation. I am simply trying to capture your perspectives on exercise motivation.

Your participation will be a valuable addition to my research and findings could lead to greater public understanding of how type of exercise (anaerobic vs. aerobic), access to social support, readiness for change, and motivation to exercise impact daily exercise adherence. The results of this study will be used in a dissertation. Data collected will not be used for any other purposes other than a dissertation focusing on increasing motivation in females to incorporate exercise into their daily routine.

Your participation is voluntary, and you are free to leave this study at any time without penalty. This study is completely confidential and no personal identification information will be collected. Each participant will be assigned a number code to help ensure that personal identifiers are not revealed during the collection, analysis and write up of findings. Data will be collected and stored on a password-protected hard drive and password-protected USB drive, which will be stored for five years in a locked file cabinet for which I have the only key, in my locked residence. After five years, the data will be deleted from my hard drive and the password-protected USB drive will be destroyed.

No compensation will be provided for participation. There are no known risks to your safety or wellbeing from answering these 55 multiple choice questions about exercise motivation. There are no known conflicts of interest with your participation in this study.

The researcher conducting this study is Victoria Wozniak. She can be reached by email at _____. If you want to talk further about your rights as a participant in this study, you can call Walden University representative, Dr. Leilani Endicott. She is the Office of Research Ethics & Compliance Director and Institutional Review Board (IRB) Chair. She can be reached at _____. Please print or save a copy of this form for your records.

The approval number for this study is 08-15-18-0118333 and it expires on August 14th, 2019.

By clicking the button below, you have read the consent form above and agree to participate in this study. This survey should take about 30 minutes to complete.

Dissertation Survey

Please answer the following questions

1. What is your gender?

○ Female

○ Male

2. Is your age between 20 to 39 years at the time you are completing this survey?

○ Yes

○ No

3. Do you engage in anaerobic or aerobic exercise?

○ Yes

○ No

4. Have you already completed the survey for a different purpose?

○ Yes

○ No

If you answered:

1. Female
2. YES you are between the ages of 20 to 39 years old
3. YES you engage in either anaerobic exercise or aerobic exercise
4. NO you have not completed the survey before

Then please proceed to question 5!

If you did not have those answers, please discontinue. Thank you!

5. Which type of exercise do you primarily engage in on a regular basis?

   ◯ Anaerobic exercise

   ◯ Aerobic exercise

6. Are you ready for lifestyle changes to be a part of your daily routine?

   ◯ Yes

   ◯ No

7. How much support can your family and friends provide?

Scored on scale of 0 (no support) to 5 (much support)

◯ 0	◯ 3
◯ 1	◯ 4
◯ 2	◯ 5

8. How many days per week do you exercise?

◯ 0	◯ 4
◯ 1	◯ 5
◯ 2	◯ 6
◯ 3	◯ 7

Dissertation Survey

Exercise Motivations Inventory - II / (EMI-II)

The following are a number of statements concerning the reasons people often give when asked why they exercise.

Whether you currently exercise regularly or not, please read each statement carefully and indicate, by indicating the appropriate number, whether or not each statement is true for you personally, or would be true for you personally if you did exercise.

If you do not consider a statement to be true for you at all, indicate the '0'.

If you think that a statement is very true for you indeed, indicate the '5'.

If you think that a statement is partly true for you, then indicate the '1', '2', '3' or '4', according to how strongly you feel that it reflects why you exercise or might exercise.

Remember, I want to know why you personally choose to exercise or might choose to exercise, not whether you think the statements are good reasons for anybody to exercise.

It helps me to have basic personal information about those who complete this questionnaire. I would be grateful for the following information:

9. To stay slim

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

10. To avoid ill-health

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

11. Because it makes me feel good

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

12. To help me look younger

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

13. To show my worth to others

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

14. To give me space to think

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

15. To have a healthy body

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

16. To build up my strength

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

17. Because I enjoy the feeling of 0 1 2 3 4 5 exerting myself

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

18. To spend time with friends

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

19. Because my doctor advised me to exercise

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

20. Because I like trying to win in physical activities

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

21. To stay/become more agile

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

22. To give me goals to work towards

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

23. To lose weight

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

24. To prevent health problems

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

25. Because I find exercise invigorating

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

26. To have a good body

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

27. To compare my abilities with other peoples'

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

28. Because it helps to reduce tension

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

29. Because I want to maintain good health

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

30. To increase my endurance

○ 0   ○ 3
○ 1   ○ 4
○ 2   ○ 5

31. Because I find exercising satisfying in and of itself

○ 0   ○ 3

○ 1   ○ 4

○ 2   ○ 5

32. To enjoy the social aspects of exercising

○ 0   ○ 3

○ 1   ○ 4

○ 2   ○ 5

33. To help prevent an illness that runs in my family

○ 0   ○ 3

○ 1   ○ 4

○ 2   ○ 5

34. Because I enjoy competing

○ 0   ○ 3

○ 1   ○ 4

○ 2   ○ 5

35. To maintain flexibility

○ 0   ○ 3

○ 1   ○ 4

○ 2   ○ 5

36. To give me personal challenges to face

○ 0   ○ 3

○ 1   ○ 4

○ 2   ○ 5

37. To help control my weight

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

38. To avoid heart disease

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

39. To recharge my batteries

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

40. To improve my appearance

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

41. To gain recognition for my accomplishments

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

42. To help manage stress

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

43. To feel more healthy

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

44. To get stronger

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

45. For enjoyment of the experience of exercising

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

46. To have fun being active with other people

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

47. To help recover from an illness/injury

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

48. Because I enjoy physical competition

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

49. To stay/become flexible

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

50. To develop personal skills

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

51. Because exercise helps me to burn calories

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

52. To look more attractive

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

53. To accomplish things that others are incapable of

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

54. To release tension

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

55. To develop my muscles

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

56. Because I feel at my best when exercising

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

57. To make new friends

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

58. Because I find physical activities fun, especially when competition is involved

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

59. To measure myself against personal standards

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

Dissertation Survey

Thank you for your participation in my study! Your participation is greatly appreciated.

I previously informed you that the purpose of the survey you completed is to study exercise motivation. The goal of my research is to improve motivation to implement exercise into a daily routine to potentially improve health and decrease obesity levels.

Results of the study will be posted in the Facebook group you were recruited from by the group's administrator at the completion of the dissertation project.

Although unlikely, if you feel upset after having completed the study or find that some questions or aspects of the study triggered distress, talking with a qualified clinician may help. If you feel you would like assistance regarding your participation in this study, please contact Dr. Petroski and Associates; phone number ‚   ___ ، Participants in this study experiencing distress are being given one free 15 minute telephone counseling session regarding participation in the study.