2019

Effects of increased indoor cycling activity on exercise motivation, body image and health perception in the adult female population

S. Latrice Totsch

EFFECTS OF INCREASED INDOOR CYCLING ACTIVITY ON EXERCISE MOTIVATION, BODY IMAGE, AND HEALTH PERCEPTION IN THE ADULT FEMALE POPULATION

by

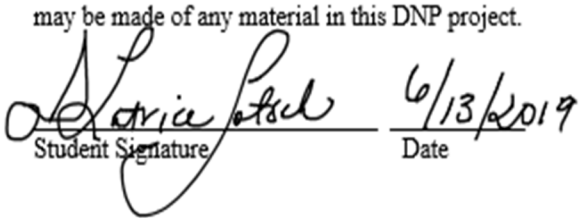
S. LATRICE TOTSCH, MSN, APRN, FNP-C

A DNP PROJECT

Submitted in partial fulfillment of the requirements for the
Degree of Doctor of Nursing Practice
to
The School of Graduate Studies
of
The University of Alabama in Huntsville

HUNTSVILLE, ALABAMA
2019

In presenting this DNP project in partial fulfillment of the requirements for a doctoral degree from The University of Alabama in Huntsville, I agree that the Library of this University shall make it freely available for inspection. I further agree that permission for extensive copying for scholarly purposes may be granted by my advisor or, in his/her absence, by the Director of the Program or the Dean of the School of Graduate Studies. It is also understood that due recognition shall be given to me and to The University of Alabama in Huntsville in any scholarly use which may be made of any material in this DNP project.



Student Signature

6/13/2019

Date

DNP PROJECT APPROVAL FORM

Submitted by S. Latrice Totsch, MSN, APRN, FNP-C in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice and accepted on behalf of the Faculty of the School of Graduate Studies by the DNP project committee.

We, the undersigned members of the Graduate Faculty of The University of Alabama in Huntsville, certify that we have advised and/or supervised the candidate on the work described in this DNP project. We further certify that we have reviewed the DNP project manuscript and approve it in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice.

Angela Hollingsworth
Committee Chair
Dr. Angela Hollingsworth, DNP, RN, CEN, NEA-BC

Elise D Adams
DNP Program Coordinator
Dr. Elise Adams, PhD, CNM

Karen Frith
College of Nursing, Associate Dean for Graduate Studies
Dr. Karen Frith, PhD, RN, NEA-BC, CNE

Marsha N. Adams
College of Nursing, Dean
Dr. Marsha Adams, PhD, RN, CNE

Graduate Dean
Dr. David Berkowitz, PhD

ABSTRACT
The School of Graduate Studies
The University of Alabama in Huntsville

Degree: Doctor of Nursing Practice College: Nursing

Name of Candidate: S Latrice Totsch, MSN, APRN, FNP-C

Title: Effects of Increased Indoor Cycling Activity on Exercise Motivation, Body Image, and Health Perception in the Adult Female Population

Purpose: The purpose of this scholarly project was to implement a program over an eight-week period that increased cardiovascular exercise, specifically indoor cycling, by at least 45 minutes a week to analyze the relationship between an increase in activity and exercise motivation, health perception, and body image within the female population.
Background and Significance: Obesity is strongly linked to medical conditions such as heart disease, hypertension, cardiovascular accidents, and diabetes. Research has shown that regular cardiovascular exercise can help prevent these conditions from developing. However, barriers to exercise such as a lack of motivation, body image concerns, and a negative health perception can prevent patients from following through with regular exercise. Providers are responsible for creating individualized plans that consider these barriers to improve compliance and positive health behaviors.
Design: A one group pre-test-post-test design was used. Participants were 14 active females who participated in an eight-week project that required an increase in indoor cycling minutes based on the Self Determination Theory to identify changes in exercise motivation, body image, and health perception.
Findings: Participants showed improvements in body image from pre-test to post-test ($a<0.05$). Health perception also showed improvement in the following categories: energy, emotional well-being, pain, and general health. Exercise motivation remained stable pre and post-test, with the primary sources of motivation being strength and endurance, weight management, and positive health measures.
Conclusion: Project results confirmed that indoor cycling improves health perception and body image with consistency in exercise motivation, therefore, proving to be a good source of cardiovascular exercise to help reduce barriers while potentially lowering risks of cardiovascular disease, diabetes, and stroke.

DEDICATION

"To do what nobody else will do, a way that nobody else can do, in spite of all we go through; that is to be a nurse."

– Rawsi Williams

It is a privilege and an honor to give of oneself to others in their time of need. My calling to the nursing profession is humbling and it has led me on an unforgettable, exciting, and stimulating journey that has only just begun. I am overwhelmed by the generosity and support of those who have helped me along the way. And for that, they deserve acknowledgment of their loyalty and devotion, and the foundation they've created to allow me to stand tall.

To my husband, who has seen me at my best and my worst and still thinks I'm super woman, I cannot put into words how thankful I am that God saved us for each other. You have been my cheerleader since the very first day I met you. I hope you know how much you have helped me become the woman that I am today.

Thank you to all of my friends, especially Christa, Cynthia, Kayla and Caitlin, that have supported me through this journey. I have an enormous amount of gratitude for my mother, father, brother and mother in law that have believed in me each and every big dream I've dared to dream.

This project is a culmination of my passion for nursing and indoor cycling. I, through exercise, have experienced personal growth, an improvement in my body image and self-perception, a positive sense of self, and a healthier lifestyle. Thank you to the participants that committed eight weeks of their time to make this possible.

ACKNOWLEDGEMENTS

To my mentor, Dr. Autumn Spence, and my chairperson, Dr. Angela Hollingsworth, thank you for your guidance during one of the most challenging times of my life. This process has pushed me through barriers I didn't know I was strong enough to overcome. Thank you to the patrons of my clinical site, The Ride House, and the owner, Parker Williams. I am proud to be a member of a family that impacts people mentally and physically on a daily to help them find a deeper connection to indoor cycling and reach goals they never thought were possible. Parker, you lead by example, not only in business but also with the support you give others.

TABLE OF CONTENTS

Identification of Problem

According to statistics published by the Centers for Disease Control, obesity affects approximately 39.8% of adults in America ("Centers for Disease Control and Prevention: Overweight & obesity," 2018). Each year in the United States, 147 billion health care dollars is spent caring for obese and overweight patients ("Centers for Disease Control and Prevention: Overweight & obesity," 2018). These funds are utilized to treat and manage comorbidities that have a connection with obese and overweight patients. A total of 71.6% of Americans age 20 and older are considered to be overweight or obese ("Centers for Disease Control and Prevention: Overweight & obesity," 2018). The cause of obesity is a multifactorial phenomenon that includes environmental, psychological, and physical influences (Apovian, 2016).

Body mass index (BMI) is the metric used in the United States to determine the fat index of a patient using height to weight ratio (Nuttall, 2015). The anthropometric measurement categorizes these fat indexes into five categories: underweight (below 18.5), healthy (18.5-24.9), overweight (25.0-29.9), obese (30.0-39.9), and extreme obesity (over 40) ("Body mass index: MedlinePlus Medical Encyclopedia," 2018). Healthcare providers can use this tool to determine possible risk factors for those in the overweight, obese, and extreme obesity categories. When dealing specifically with the female population, it should be noted that certain ages, races, and ethnicities are more likely to be overweight or obese than others ("Weight and obesity," 2018). For example, minority women, those over 60, and lesbian and bisexual women are more likely to be overweight or obese, placing them at a higher risk of developing comorbidities related to this issue.

Comorbidities associated with obesity include hyperlipidemia, hypertension, cardiovascular disease, type II diabetes, stroke, and respiratory disorders, among many others

(Abdelaal, Roux, & Docherty, 2017). Obesity increases a patient's risk of disease and mortality. This increased risk decreases the life expectancy of obese persons by approximately 5-20 years (Abdelaal, Roux, & Docherty, 2017). However, a loss of 3-5% of overall body weight can help decrease these risks ("Weight and obesity," 2018).

Since a sedentary lifestyle can contribute to becoming overweight and obese, regular exercise as a source of prevention should be strongly encouraged by health care providers to combat this. Research has shown that regular exercise has benefits, even in those who are not overweight or obese. For example, cardiovascular exercise can improve cardiorespiratory performance, sleep, cognition and promote better bone health, and improve depression or anxiety ("American Heart Association recommendations for physical activity in adults and kids," 2018). Sources of motivation highly regulate participation in exercise. These sources can come from internal or external factors. Having a clear understanding of what motivates a person to exercise regularly, maintain a positive body image, health perception, and health behaviors is essential in creating an individualized plan of care that take barriers and challenges into consideration to improve compliance and promote long-term success.

The purpose of this scholarly project was to implement a program over an eight-week period that increases cardiovascular exercise, specifically indoor cycling, by at least 45 minutes a week to analyze the relationship between an increase in activity and exercise motivation, health perception, and body image within the female population. The information was collected using several valid and reliable surveys. The data were analyzed, and the results can now be used in daily practice to create individualized care plans that focus on using the most common sources of motivation.

PICOT Question:

How does increased minutes of weekly cardiovascular exercise (indoor cycling) affect exercise motivation, body image, and health perception in the adult female population?

Exercise Science and Motivation

Cardiovascular exercise, or aerobic exercise, is any activity that uses large muscle groups and requires the cardiorespiratory system to supply oxygen to the skeletal muscles to complete the tasks (Patel et al., 2017). Aerobic exercise is further broken down into categories depending on the effort or intensity of the activity. Moderately intense exercise includes brisk walking, dancing, and slow biking ("American Heart Association recommendations for physical activity in adults and kids," 2018). Vigorous exercise requires more effort than moderately intense exercise. Examples of vigorous exercise include running, cycling at 10 miles per hour or more, swimming, or hiking ("American Heart Association recommendations for physical activity in adults and kids," 2018). The current recommendations state that individuals should complete a minimum of approximately 150 minutes a week of moderate exercise or 75 minutes of vigorous activity ("American Heart Association recommendations for physical activity in adults and kids," 2018). There is an even larger benefit for those that complete 300 minutes of exercise a week ("American Heart Association recommendations for physical activity in adults and kids," 2018). The U.S. Department of Health and Human Services reports that less than 5% of adults complete 30 minutes of physical activity a day ("Facts & statistics," 2017). Furthermore, only one in three adults achieves the recommended amount of weekly physical exercise ("Facts & statistics," 2017).

Exercise motivation is a complex concept and is typically described as something that moves a person to action (Ryan & Deci, 2018). Thus, exercise motivation is the crux of health behavior and adherence to consistent participation in cardiovascular exercise. Sources for

motivation are derived from external or internal factors. The Self Determination Theory states that autonomy-supportive environments improved patient outcomes; therefore, encouraging patients to participate in activities autonomously promotes long-term success (Ryan & Deci, 2018). By identifying sources of exercise motivation and understanding how it contributes to exercise behavior, providers will be able to increase exercise in the individuals they serve to promote positive health behaviors (Mokarti et al., 2017).

Health Perception

Health perception refers to a person's view of their health status across seven domains: memory or cognitive function, physical ability, medical conditions, disabilities, care-seeking, and quality of life (Curi, Vilaça, Haas, & Fernandes, 2018). Mood, physical or mental impairments, environment, and culture can impact health perception. A negative perception of health creates barriers to achieving goals. Studies have shown that there is a strong correlation between positive health perception and the participation of physical activity (Silva et al., 2018).

Body Image and Perception

Body image can be defined as a person's perception or feelings about their body (Holland & Tiggemann, 2016). Positive body image, which focuses on a favorable view, opinion, and respect of one's body, has gained considerable attention (Tylka & Wood-Barcalow, 2015). A positive perception of body image is connected with good mental health; thus, poor body image is linked with an increase or probability of physical ailments, depression and eating disorders ("Body image and mental health," 2018). Those who engage in regular physical activity tend to have a better perception of their body image (Halliwell, 2015). Females, specifically, tend to have a more negative perception of themselves than their male counterparts (Holland & Tiggemann, 2016). Women were chosen as the focus of this project because of this research.

Media in the United States uses television, internet, newspapers, and magazines to portray the perceived ideal female body image. The overuse of such images, along with the lack of diversity and inclusion of others, promotes internalization of negative thoughts and feelings, therefore, fostering a negative body image (Freitas, Jordan, & Hughes, 2018). In a social media driven culture, platforms such as Facebook, Snapchat, and Instagram reinforce these thoughts (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015). In an already venerable demographic, these platforms create an environment of social comparison that can worsen or create body dissatisfaction and disordered eating (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015).

Indoor Cycling

Indoor cycling is a cardiovascular exercise that has gained attention throughout the years because of its proven ability to assist with weight loss. Indoor cycling is quite an inclusive activity. People of different body types, ages, and fitness levels can participate in an instructor-led class. These types of classes are widely available at gyms and studios across the United States. The effort required to complete a cycling class is a mix of moderate and vigorous intensity as proven in multiple recent studies (Callegari et al., 2015). This is important because by participating in this exercise at a vigorous level, the patient can spend less time working out for the same benefit.

Project Goals

Every day providers face the task of guiding patients to healthy lifestyles to attain more positive outcomes. Navigating this can be complicated considering there are many reasons why a patient doesn't take an active role in their healthcare decisions or lack the motivation to comply with interventions that would decrease their risk for certain disease processes especially when family history or risk factor exists. Factors such as lack of time or prioritization, low perception

of their health, mental health status, and lack of funds or accessibility should be well-thought-out when developing a plan. These perceived or actual barriers can serve as strong obstacles to maintaining positive health behaviors. Failure by the provider to address these barriers may undermine the patient's ability to follow through with the outlined plan of care. Specifically, in the female population, these barriers may be harder to overcome due to the exposure to societal pressure and media representation of the ideal body type. These exposures can cause a negative body image that threatens the participation in self-care behaviors such as regular cardiovascular exercise (Gillen, 2015). The goals of this project were to identify exercise motivation changes as well as body image and health perception improvements through a regular exercise regimen.

Project Objectives

- Identify exercise motivations among the female population
- Understand how cardiovascular exercise affects body image
- Understand how cardiovascular exercise affects health perceptions

Conceptual Framework

The Self Determination Theory is the conceptual framework that was utilized as a guide during this project. This theory focuses on the source of motivation and how it impacts actions. According to this theory, motivation is a continuum that is influenced by autonomy (Ryan & Deci, 2018). Autonomy, in this realm, is considered to be self-determined and freely initiated behaviors (Ryan & Deci, 2018). Sources of motivation can be derived from internal (intrinsic) or external (extrinsic) factors with each yielding different levels of success according to research. The Self Determination Theory postulates that a person needs three components (autonomy, competence, and relatedness) for the initiation of motivation and long-term maintenance of health behaviors (Silva, M., Marta, M., & Teixeira, P., 2014).

Intrinsic motivation includes that which derives from internal, intangible factors. For example, a person motivated by intrinsic factors may exercise just from the pleasure of participating in or completing an activity. Extrinsic motivation is grounded in external factors. For example, a patient may participate in a particular exercise because it helps them achieve a specific outcome, personal value, or importance (Gagne, 2015). Sources of extrinsic motivation could be weight loss, looking slimmer, appearing stronger, or feeling fitter. Figure 1 shows the constructions of the Self-Determination Theory.

Review of Evidence

Current evidence regarding this topic was reviewed during the literary search. The following search engines were used to find relevant evidence: Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, UAH online library, and Google Scholar. MeSH (Medical Subject Headings) terms included cardiovascular exercise, motivation, body esteem, body image, and indoor cycling. Inclusion criteria such as peer-reviewed articles, articles that were published within the last ten years and English language were applied. The initial search for "cardiovascular exercise" yielded 981,000 results. Once "motivation" was applied, the results were narrowed to 29,100. Adding "indoor cycling" yielded approximately 13,900 results; however, most of the available articles were not specific to this particular project. Twelve articles that were closely matched to the topic, study type, and outcomes most applicable to the topic were chosen.

These relevant studies mainly focused on motivation, body image, and health perception as they related to exercise compliance and adherence. It should be noted that none of the studies reviewed focused explicitly on the relationship between motivation, body image, and health

perception concerning indoor cycling. The literary review yielded several themes discovered in recent evidence-based studies.

Motivation

Many of the studies reviewed state that the Self Determination Theory was utilized as the theoretical approach in analyzing the data collected. Intrinsic motivation, or motivation that stems from the enjoyment of the activity, seemed to provide the best predictor of whether a client would continue to adhere to a physical activity regimen (Duncan, Hall, Wilson & O, 2010; Ryan & Deci, 2018). The reason for this may be because physical changes and weight loss are not the sole interest of the participant who is motivated by intrinsic factors. In addition to possessing intrinsic motivation, those participants that are more autonomous tend to be the most successful in adhering to long term exercise goals (Silva et al., 2018). As Silva et al. (2011) notes, in the absence of support, autonomous clients are more likely to stay on course by transforming their environment to continue to complete the tasks.

Those motivated by external factors are less likely to sustain a regular pattern of exercise (Magnus, Kowalski, & McHugh, 2010). These clients often feel obligated to participate in such activities instead of completing them because of their enjoyment of the task at hand. Although extrinsic motivation is connected to poorer outcomes, some research suggests that a combination of intrinsic and extrinsic motivation is essential (Egli, Bland, Melton, & Czech, 2011). There has been extensive research to identify sources of motivation and how that translates to exercise adherence, even so, it is still unclear why only approximately 20% of individuals can continue healthy lifestyle behaviors with regular physical activity (Silva et al., 2018).

Body Image and Psychological Factors

While motivation is an essential component of exercise compliance, the psychological aspect of exercise is equally important. Teixeira et al. (2006) reinforce the need to explore psychological needs related to exercise and motivation to predict the success rate of an individual. A perspective identified in studies dealing with body image included the theme that to nurture a positive body image, physical exercise should focus on body mastery and enjoyment of a particular exercise other than weight loss or the changing of appearances (Zajac & Schier, 2011). Interestingly, it was found that cardio-based exercise was related to negative body image due to a feeling of self-objectification and comparison to others participating in a similar exercise (Zajac & Schier, 2011). Environments that promote such physical comparison reinforce exercise dependence disorders, which can negatively impact the individual (González-Cutre & Sicilia, 2012). For example, exercise settings with mirrors and the presence of other patrons can create a self-conscious feeling about performance and physical fitness (Magnus, Kowalski, & McHugh, 2010). Because of this, a participant may be less likely to continue a particular exercise at a studio or a gym due to the fear of being compared to others or not feeling good enough. However, yoga-type exercises seemed to have the opposite effect than that of cardiovascular exercise when specifically dealing with body image and how one feels about themselves while engaging in the activity (Zajac & Schier, 2011). Participating in regular exercise in a perceived supportive environment can improve one's perception of self. Homan & Tylka (2014) found that women who participated in moderate to strenuous exercise tended to report a high level of appreciation for their bodies.

Exercising for weight loss was more frequently related to a negative emotion about the client's body (Silva et al., 2011). Silva et al. (2011) suggest that the connection between self-worth and body image deserves attention because these are strongly connected with

physiological and psychological effects which affect how and if exercise is sustained. The benefits exercise provides to those with anxiety and depression has been proven as well and is a vital tool to use in practice. Research has shown that acute bouts of exercise have been proven to decrease anxiety and increase energy, which can, in turn, contribute to better adherence to an exercise regimen (Kwan & Bryan, 2010). Multiple randomized clinical studies have shown adding exercise to the treatment plan of a patient with depression is acceptable as an adjunct therapy, those experiencing treatment-resistant depression, patients with chronic medical illnesses, and antenatal patients (Hearing et al., 2016). Some studies have also shown that exercise alone has decreased patient's symptoms as effectively as pharmacotherapy and cognitive-behavioral therapy (Hearing et al., 2016).

Regimen

Lifestyle interventions are the most cost-effective to reduce medical conditions that worsen health and increase healthcare spending; therefore, it's necessary to identify how to support clients in adhering to a feasible exercise regimen (Silva et al., 2011). Long term behavioral interventions (nutritional counseling, adherence to exercise routine) facilitate an ability to maintain and manage body weight more effectively over an extended length of time (Silva et al., 2011). Miranda et al. (2014) specifically focused on an older population; however, when examining the factors that promote adherence, the opportunity for socialization was among the top predictors of exercise adherence. This same study also discovered that those who possessed a poor perception of health felt discouraged from being as active as they would have liked to be. In addition to this, barriers such as transportation, socio-economical status, support, and time also affect an individual's ability to be consistent with exercise (Kamimura et al.,

2014). Barriers to compliance should be explored extensively to create an environment that is conducive to success.

Plan

The doctorate of nursing practice scholarly project was conducted at an indoor cycling studio, The Ride House, in Dallas, Texas. The owner, Parker Williams, granted permission to utilize the facility. Indoor cycling and strength training classes such as TRX, deep stretching, and Cycle+Sculpt are offered at this studio. The population focus was adult females due to the extensive information and research available that outlines the struggles of females with body image and weight management issues. After Institutional Review Board approval was obtained, numerous flyers were placed within the studio. These were available for viewing for one week and included a brief description of the project, the rules of inclusion for participants, and contact information for the principal investigator. According to the flyer, participants were required to be 18 years old or older, female, and participate in less than 300 minutes of combined exercise a week. All fitness levels were accepted. Participants that emailed the principal investigator were emailed with a more detailed description of the requirements of the project with a timeline for the beginning and end of the project as well as a deadline to return paperwork. The email also stated that the requirements for participation were to increase their activity by at least one cycling class at The Ride House each week for eight weeks. The surveys were to be completed at the beginning of the eight weeks and at the end to assess for changes in activity level, body image, health perceptions, and motivation. The Godin Leisure-Time Exercise Questionnaire, Exercise Motivations Inventory-2 survey, Body Image Quality of Life Inventory, RAND SF-36 survey, and informed consent were attached to the email. In addition to the above requirement, the participant was also responsible for logging their weekly exercise on a log provided to them.

All participants were assigned an alphanumeric identification number to maintain confidentiality. Participants were responsible for depositing these documents in a locked box at the front desk. All materials provided to the participants via email are available for review in the following Appendixes: Memorandum of Understanding (Appendix C), DNP Project Flyer (Appendix D), Informed Consent (Appendix F), Godin Leisure-Time Exercise Questionnaire (Appendix H), Exercise Motivations Inventory-2 survey (Appendix J), Body Image Quality of Life Inventory (Appendix K), RAND SF-36 survey (Appendix I).

Godin Leisure-Time Exercise Questionnaire

The Godin Leisure-Time Exercise Questionnaire is a short questionnaire that allows the participant's activity level to be converted into statistical data. The participant indicated the frequency and intensity of exercise. A composite score is established and converted into a weekly activity score. The validity and reliability of this tool have been established in active and inactive adults (Amireault & Godin, 2015). According to established guidelines, a score equal to or greater than 24 is considered active (Amireault & Godin, 2015). A score of 23 or less is considered insufficiently active (Amireault & Godin, 2015).

Exercise Motivation Inventory-2

The Exercise Motivation Inventory-2 survey is a 51-item survey used to assess exercise motivations by using Likert scales (Kamimura et al., 2014). There are five subgroups and 14 subscales (Kamimura et al., 2014). These assess for psychological, social, health-related, weight-related, and physical strength-related motivation (Kamimura et al., 2014). This tool has been proven to be valid and reliable for assessing exercise motives across different populations (Markland & Ingledew, 1997).

RAND SF-36 Short Form

The RAND SF-36 Short Form survey uses eight concepts to explore health perception. These concepts include physical ability, pain, limitations due to health conditions, limitations due to personal or emotional distress, social functioning, energy level, and general health perceptions ("36-Item Short Form Survey from the RAND Medical Outcomes Study," n.d.). The short form survey was adapted from the Medical Outcomes Study (MOS) completed in 1992 ("36-Item Short Form Survey from the RAND Medical Outcomes Study," n.d.). Medicare widely uses this tool to monitor the health perception of patients; however, it relies on the truthfulness of the client to yield useful results ("36-Item Short Form Survey from the RAND Medical Outcomes Study," n.d.). The RAND SF-36 survey has been used to assess the changes of many populations with a focus on those with chronic illnesses. However, its reliability and validity were confirmed in a Thai study that included healthy males and females (Lim, Seubsman, & Sleigh, 2008). Limited recent data is available to verify similar findings in a study that uses the English language RAND SF-36 Short Form survey tool.

Body Image Quality of Life Inventory

Dr. Thomas Cash developed the Body Image Quality of Life Inventory in 2002 (Cash & Fleming, 2002). This tool assesses body image, psychosocial functioning, and how these things affect an individuals' quality of life (Cash & Fleming, 2002). This tool explores 19 life domains on a 7-point response scale. Some of the domains explored include a sense of self, social interaction, sexuality, emotional well-being, and exercise (Cash, n.d.). The Body Image Quality of Life Inventory tool has been verified to be internally consistent and stable over a two to three week period in a 2002 study (Cash & Fleming, 2002). Validity and reliability have been proven in female populations, but more research may be necessary for male counterparts and older adult populations (Cash & Fleming, 2002).

Implementation

The participants were responsible for completing at least one extra 45-minute indoor cycling class in addition to their baseline (established on the Godin Leisure-Time Exercise Questionnaire) each week with a limit of 300 minutes of combined exercise a week. This limitation was developed using the statement by the American Heart Association in regards to there being a benefit of completing five hours of exercise weekly. More than one extra class could be taken as long as the participant remained under 300 minutes for their weekly total. All classes offered at The Ride House have a similar structure and length (30 minutes-60 minutes). The participant was responsible for reporting their weekly exercise minutes at the end of each week by depositing a reporting form using their assigned alphanumeric identification number into a locked box at the desk which the principal investigator possessed the key. The participants were free to take any instructor they wished to take for the convenience of schedules. This information was kept on an Excel database that was saved on an encrypted password file (USB drive) and kept in a locked container for which only the principal investigator had the key to minimize potential harm to the participant. After the eight weeks, the surveys were completed again and submitted. The data were analyzed using SPSS software for statistical information. Quantitative data were reviewed for common themes as well as differences noted from the answers provided at the initiation of the project versus the conclusion. The timeline for the project is outlined in Appendix A.

Statement Related to Human Subjects

An Institutional Review Board approval was necessary for this project as it deals directly with human subjects. Human subjects were observed throughout the project utilizing surveys with a priority in providing anonymity to ensure credible results. A separate IRB approval was

not necessary for the project site. A copy of the Institutional Review Board approval is available in Appendix B.

Barriers

Barriers to the project were few but significant. Attrition rate due to one's inability to continue increased minutes of exercise was a possibility. Furthermore, patients could experience activity intolerance if they were not conditioned enough to comply with the increased minutes of cardiovascular exercise weekly. The risk of injury during physical activity was also a potential barrier. In addition to this, consideration regarding the time commitment to complete the lengthy questionnaires was acknowledged. Non-compliance with completion would warrant disqualification from the project.

Sample

There were nineteen participants in the project that met all the requirements outlined in the email. These participants were females that were 18 years old or greater and were participating in 300 minutes of exercise a week or less. Five participants did not complete the entire eight-week program due to family illness and personal illness. Fourteen participants completed the project and returned all demographic information, consents, and surveys. This amount falls short of the initially projected number of 30-50 participants; however, the principal investigator and the project chair agreed that this was a sufficient number of participants to gather useful data.

Demographics

Data collection occurred at a cycling studio in Dallas, Texas named The Ride House. All participants were female and over the age of 18 (N=14, M age= 30.86, SD= 7.08, age range: 25-53). Of these participants, 71.4% were single, 28.6% were married. The majority of the

participants identified as white, non-Hispanic at 85.7%. The remaining breakdown included 7.1% for both Hispanic and black participants. Figure 2 summarizes this data.

Information regarding salary and education level was collected because both of these were referenced in literature when identifying possible barriers to positive health behaviors. The median salary of all participants that submitting this information was $69,169 (Median= $70,000, SD= $16,244, range: $40,000-$90,000). Most participants had higher education: some college- 7.1%, Bachelor's degree- 57.1%, Master's degree- 28.6%, None- 7.1%. A visual representation of this data can be reviewed in Figure 3.

Major Findings

Multiple surveys were used to assess the current exercise activity level, motivations, body image, and perceptions of health. These were completed pre and post-intervention. The data collected were analyzed using SPSS software to identify significant differences between the two sets of data.

Godin

The Godin Leisure-Time Exercise Questionnaire is a self-administered questionnaire that gathers information on the number of times the participant engages in different levels of exercise during a typical seven-day period. Three options are provided: mild (minimal effort: yoga, easy walking), moderate (not exhausting: easy swimming, dancing, easy cycling), strenuous (heart beats rapidly: vigorous cycling and swimming) (Amireault & Godin, 2015). Each score of the individual categories is then multiplied by a corresponding Metabolic Equivalent of Task or MET (Amireault & Godin, 2015). The cumulative sum of each category is the total Godin score. The pre-intervention Godin scores averaged 33.29 (SD- 13.986, range: 15-62). The post-intervention Godin scores averaged 36.64 (SD- 14.457, range 8-57). This correlates to a p-value

of 0.333, which is not a statistically significant difference. See Table 1 for the Godin Leisure-Time Exercise Questionnaire results.

While the overall scores increased, six participants reported a decrease in their average exercise on the post-intervention questionnaire. One participant (1K) noted that she typically runs five times a week but was experiencing a decreased in her activity due to an injury. Interestingly, when reviewing the data submitted by the participants that had a decrease in their reported activity from pre to post-intervention, it was noted that four out of six of the participants had an increase in the intensity of their exercise or the number of weekly episodes. Due to the MET calculation, however, in these instances, the post-intervention score fell short of the pre-intervention score.

Exercise Motivation Inventory-2 Survey

The Exercise Motivation Inventory 2 Survey is a 51-item questionnaire that explores the sources of motivation to participate in regular exercise. These items can be separated into five submodels (Body Related Motives, Health Motives, Interpersonal Motives, Fitness Motives, Psychological Motives), followed by fourteen categories relating to those submodels (Appearance, Weight Management, Health Pressures, Ill-Health Avoidance, Positive Health, Affiliation, Competition, Social Recognition, Nimbleness, Strength and Endurance, Enjoyment, Challenge, Revitalization, and Stress Management) (Markland & Ingledew, 1997). Participants were asked to indicate whether each statement was true or not true using a six-point (0-5) Likert type scale (Markland & Ingledew, 1997).

The pre-intervention scores showed that the top four sources of motivation were ill-health avoidance, strength and endurance, weight management, and positive health measures. Similarly, the top three sources remained the same in the post-intervention scores. However, the fourth source shifted to enjoyment instead of positive health measures, which is significant seeing as

this is an intrinsic source of motivation. An increase in intrinsic motivation is the strongest predictor of long-term results such as adherence and continued participation in a particular program (Pearson & Hall, 2013). See Table 2 for the Exercise Motivation Inventory results.

The lowest ranking category was Health Pressures. The questions in this category were "because my doctor advised me to exercise," "to prevent an illness that runs in my family," and "to recovery from an illness/injury."

Body Image and Quality of Life Inventory

The Body Image and Quality of Life Inventory measures the impact body image has on one's life. This scale thoroughly measures how the participant's current body image affects their emotional state, activities, relationships, and sexual experiences (Cash & Fleming, 2002). It is a 7-point scale ranging from -3 to +3, therefore allowing for negative and positive ratings (Cash & Fleming, 2002). The scoring includes adding each item and averaging them by the number of items in the survey.

A paired T-test was used to analyze the data collected pre and post-intervention. The mean pre-intervention score was -0.1242 (SD= 1.2925). The mean post-intervention score was 1.1353 (SD= 1.2652). The SPSS analysis showed a p-value of .006 (a=0.05), t(13)= -3.284, which is a statistically significant change. These results prove that the increased amount and intensity of exercise positively affected the participant's body image and the effects it had in their personal lives. See Table 3 for complete results of the Body Image and Quality of Life Inventory.

RAND SF-36 Survey

The RAND SF-36 survey is a 36-item survey of questions to assess the quality of life. The eight health concepts measures are physical functioning, bodily pain, role

limitations due to physical health problems, role limitations due to personal and emotional problems, general mental health, social functioning, energy and fatigue, and general health (Hays, Sherbourne, & Mazel, 1993; Bunevivius, 2017). Precoded numeric values were recoded according to the scoring recommendations. Each item was scored ranging from 0-100. The higher the score, the more favorable the state of health is considered. The items of the categories were averaged together to produce the scores in Table 4.

SPSS software was used to analyze the data collected. A paired t-test compared the pre and post-intervention scores. Physical functioning, role limitations due to physical health, role limitations due to emotional problems, and social functioning results were not statistically significant. However, the p values of the following categories were less than a=0.05; therefore there was a significant change from the pre and post-intervention scores energy (p=.002, t(13)= -3.758), emotional well-being (p= .006, t(13)= -3.309), pain (p= .032, t(13)= -2.409), and general health (p= .015, t(13)= -2.797).

Discussion

The purpose of the DNP project was to identify whether an increase in cardiovascular exercise, specifically from indoor cycling, would affect exercise motivation, body image, and health perception in the female population over eight weeks. Considering the steady rise in overweight and obese individuals, identifying sources of motivation to exercise regularly is important. Providers should seek a broader knowledge of the barriers to positive health behaviors. Although there are plenty of obstacles, two of the barriers this project focused on were body image and health perception. Since women are at an increased risk for disordered eating and body image issues from constant media exposure to images that induce a comparative nature, they were the population focus of this project. The DNP project sought to identify the

main sources of motivation and whether an increase in cardiovascular exercise, specifically indoor cycling, could improve body image and health perceptions. This information could provide evidence that may be utilized in everyday practice by healthcare providers when developing an individualized plan for patients.

Results

The following surveys were used to collect data for the project: Godin Leisure-Time Exercise Questionnaire, Exercise Motivations Inventory-2 survey, Body Image and Quality of Life Inventory, and the RAND SF-36 survey. Utilizing the paired t-test with SPSS software, no statistical difference was found between the pre-intervention and post-intervention Godin Leisure-Time Exercise Questionnaire scores; however, there was an increase in the mean score from 33 to 36. In many of those that had a lower post-intervention Godin score than a pre-intervention score, their activity logs and Godin survey confirmed a shift to a higher level of intensity in their workouts or an increase in the episodes per week.

The Exercise Motivations Inventory-2 survey reveals that the primary sources of motivation for exercise were for positive health improvement, strength and endurance, and weight management. Interestingly, the lowest rated motivation category was health pressures, which included suggestions to lose weight by the provider, prevention of illness that appears to run in the family, and to recover from illness or injury. This information is not in line with research that shows exercise recommendations or prescriptions from healthcare providers increased physical activity (O'Brien, Shields, Oh, & Fowles, 2017; Leemrijse, Bakker, Ooms, & Veenhof, 2015). Contrastingly, the results of the survey are consistent with research showing that women are more likely to exercise for weight-related issues (Kamimura et al., 2014).

The results of the Body Image and Quality of Life Inventory reveal that there was an improvement in the participant's perception of self and their body image when assessing how this affected multiple areas of their life. These findings are consistent with the Pearson & Hall (2013) 18-week cardiovascular exercise study that revealed positive changes in body image and investment in being physically fit.

The RAND SF-36 survey exhibited statistically significant positive changes in energy, emotional well-being, pain, and general health categories. The remaining categories all revealed an increase in their scores, but when analyzed with SPSS software, they were not shown to be statistically significant. These findings were somewhat similar to the literature. Yaman & Atay (2018) found that utilizing an increase in exercise improved general health perception as well as mental health perception. The specific domains that showed statistically significant changes in the SF-36 results were physical function, physical role function, body pain, mental health, vitality, and emotional role function (Yaman & Atay, 2018). The SF-36 differs from the RAND SF-36 survey in the categories and scoring of the tool. However, both can be used to assess changes in health perception.

Implication for Practice

Preventative medicine should be at the forefront of practice. It is well documented that physically active persons are less likely to suffer from hyperlipidemia, hypertension, stroke, and coronary artery disease (Yaman & Atay, 2018). Providers have the unique duty to address potential risks for these issues and promote regular exercise to decrease these risks (Yaman & Atay, 2018). Lack of motivation and barriers to regularly participating in cardiovascular exercise should be addressed accordingly so a plan can be developed that promotes success. These barriers can be perceived, mental, or physical and are very valid to the patient. In addition to a

lack of motivation, the patient's perception of health and body image can also affect their ability to continue with exercise. With the findings noted in this project, healthcare providers can focus on developing goals that focus on the top three sources of motivation: strength and endurance, weight management, and positive health measures. Individual targets can be developed for each category as a collaborative effort between the healthcare provider and the patient. A collaborative approach, coupled with an exercise prescription from the provider, may yield long-lasting results. Although the results of this project did not reflect this, it has been proven that exercise prescriptions increase physical activity in patients (Yaman & Atay, 2018). The data from this project confirms that by increasing physical exercise we can, in turn, improve body image and the patient's perception of health creating positive health behaviors that result in a decrease in disease, disorders, and mortality.

Limitations and Considerations

Limitations and considerations should be assessed and evaluated for every project or study to identify elements that impacted or influenced the results and a possible need for further research. Although an increase in cardiovascular exercise yielded positive outcomes, the results would have been more robust and reliable if there was a control group for comparison. Nevertheless, the lack of a control group does not invalidate these findings.

Another consideration that would need further investigation would be the effect of the intensity of exercise on motivation, health perception, and body image. For example, if the minutes of exercise or the episodes of exercise remained the same, but the intensity changed, would this change the post-intervention results? This consideration was sparked by the results of the Godin Leisure-Time Exercise Questionnaire and the lack of a significant increase in the

exercise score. Instead, an increase in intensity yielded a change in body image and some aspects of health perception.

The majority of the participants were white non-Hispanic, possessed a college education, and had a median annual salary of $70,000, which is significantly higher than the average median salary of $31,610 (Fontenot, Semega, & Kollar, (2018). The Ride House is located in an affluent area of Dallas, Texas referred to as University Park. According to the United States Census Bureau (n.d.), the median household income is $211,741, and the median home value in this area is 1.19 million dollars. This is not an area that reflects the average demographics of the United States. Research has shown that those of a lower income are less likely to spend time exercising regularly (Kamimura et al., 2014). Repeating this program with a larger sample size that would include a more diverse demographic may yield different results because people of different races or ethnicities, education level, and salary level may have a different set of barriers, mental and emotional challenges, access to resources and perceptions of self and health.

Finally, qualitative data would have been useful to explain further if there were external factors outside of an increase in indoor cycling that affected the results of the surveys. Commentary about how the participants overcame specific barriers, what they considered personal barriers, what led to a shift in the intensity of exercise, or an inability to continue with a program would be helpful to understand how these things affected the outcome of the results. Furthermore, qualitative data might help answer the question of how increasing the intensity of exercise alone, instead of frequency, relates to an improvement in body image and health perception.

Dissemination of Results

The results of the project will be displayed on a poster at The Ride House for review by the clients. In addition to this, a manuscript will be submitted for publication to Body Image: An International Journal of Research. The journal is an international peer-reviewed journal that publishes articles on body image, physical appearance, and social and behavioral sciences ("Body image," 2019). Dissemination of results from projects and studies completed by doctorally prepared nurse scholars is essential because sharing evidence-based findings can influence and improve current practice and patient outcomes. The manuscript for publication is available to review in Appendix M.

Conclusion

To the principal investigator's knowledge, this is the first project with a focus on indoor cycling as the cardiovascular exercise of choice. Since this is a unique project, the correlation between motivation, body image, and health perceptions with indoor cycling was unknown. The results of the project proved that with an increase in cardiovascular exercise, specifically indoor cycling, body image was improved along with the health perception of the participants. Motivation to complete exercise remained stable across eight weeks, therefore, providing useful data as a base for creating an exercise plan rooted in the most common sources of motivation expressed by the participants.

References

Abdelaal, M., Roux, C. W., & Docherty, N. G. (2017). Morbidity and mortality associated with obesity. *Annals of Translational Medicine,5*(7), 161-161. doi:10.21037/atm.2017.03.107

American Heart Association recommendations for physical activity in adults and kids. (2018). Retrieved from https://www.heart.org/en/healthy-living/fitness/fitness-basics/aha-recs-for-physical-activity-in-adults

Amireault, S., & Godin, G. (2015). The Godin-Shephard Leisure-Time Physical Activity Questionnaire: Validity evidence supporting its use for classifying healthy adults into active and insufficiently active categories. *Perceptual and Motor Skills,120*(2), 604-622. doi:10.2466/03.27.pms.120v19x7

Apovian, C. M. (2016). Obesity: Definition, comorbidities, causes, and burden. Retrieved from https://www.ajmc.com/journals/supplement/2016/impact-obesity-interventions-managed-care/obesity-definition-comorbidities-causes-burden?p=1

Body image. (2019). Retrieved from https://www.journals.elsevier.com/body-image/

Body image and mental health. (2018). Retrieved from https://www.womenshealth.gov/mental-health/body-image-and-mental-health

Body mass index: MedlinePlus Medical Encyclopedia. (2018). Retrieved from https://medlineplus.gov/ency/article/007196.htm

Bunevicius, A. (2017). Reliability and validity of the SF-36 Health Survey Questionnaire in patients with brain tumors: A cross-sectional study. *Health and Quality of Life Outcomes, 15*(1). doi:10.1186/s12955-017-0665-1

Callegari, B., de Melo dos Santos, R., Costa e Costa, F., Sepeda Saraiva, T., Maniglia de Resende, M, Cristinne Silva Carvalho, N., …Beda, A. (2015). Short-term adaptations in

sedentary individuals during indoor cycling classes. Archivos de medicina del deporte. 32(6) 374-381.

Cash, T. (n.d.). Body image assessments: BIQLI. Retrieved from http://www.body-images.com/assessments/biqli.html

Cash, T. F., & Fleming, E. C. (2002). The impact of body image experiences: Development of the body image quality of life inventory. *International Journal of Eating Disorders,31*(4), 455-460. doi:10.1002/eat.10033

Centers for Disease Control and Prevention: Overweight & obesity. (2018). Retrieved from https://www.cdc.gov/obesity/data/adult.html

Chen, K., & Jang, S. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior,26*(4), 741-752. doi:10.1016/j.chb.2010.01.011

Curi, V., Vilaça, J., Haas, A., & Fernandes, H. (2018). Effects of 16-weeks of Pilates on health perception and sleep quality among elderly women. *Archives of Gerontology and Geriatrics,74*, 118-122. doi:10.1016/j.archger.2017.10.012

Duncan, L. R., Hall, C. R., Wilson, P. M., & O, J. (2010). Exercise motivation: A cross-sectional analysis examining its relationships with frequency, intensity, and duration of exercise. *International Journal of Behavioral Nutrition and Physical Activity,7*(1), 7. doi:10.1186/1479-5868-7-7

Egli, T., Bland, H. W., Melton, B. F., & Czech, D. R. (2011). Influence of age, sex, and race on college students' exercise motivation of physical activity. *Journal of American College Health,59*(5), 399-406. doi:10.1080/07448481.2010.513074

Facts & statistics. (2017). Retrieved from https://www.hhs.gov/fitness/resource-center/facts-and-statistics/index.html

Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image,13*, 38-45. doi:10.1016/j.bodyim.2014.12.002

Fontenot, K., Semega, J., & Kollar, M. (2018). Income and poverty in the United States: 2017. Retrieved from https://www.census.gov/library/publications/2018/demo/p60-263.html

Freitas, C. D., Jordan, H., & Hughes, E. K. (2018). Body image diversity in the media: A content analysis of women's fashion magazines. Health Promotion Journal of Australia, 29(3), 251-256. doi:10.1002/hpja.21

Gagne, M. (Ed.). (2015). *The Oxford handbook of work engagement, motivation, and self-determination theory*. Oxford, NY: Oxford University Press.

Gillen, M. M. (2015). Associations between positive body image and indicators of men's and women's mental and physical health. *Body Image,13*, 67-74. doi:10.1016/j.bodyim.2015.01.002

González-Cutre, D., & Sicilia, Á. (2012). Motivation and exercise dependence. *Research Quarterly for Exercise and Sport,83*(2), 318-329. doi:10.1080/02701367.2012.10599863

Halliwell, E. (2015). Future directions for positive body image research. *Body Image,14*, 177-189. doi:10.1016/j.bodyim.2015.03.003

Hays, R. D., Sherbourne, C. D., & Mazel, R. M. (1993). The RAND 36-item health survey 1.0. *Health Economics,2*(3), 217-227. doi:10.1002/hec.4730020305

Hearing, C. M., Chang, W. C., Szuhany, K. L., Deckersbach, T., Nierenberg, A. A., & Sylvia, L. G. (2016). Physical exercise for treatment of mood disorders: A critical review. *Current Behavioral Neuroscience Reports,3*(4), 350-359. doi:10.1007/s40473-016-0089-y

Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image,17*, 100-110. doi:10.1016/j.bodyim.2016.02.008

Homan, K. J., & Tylka, T. L. (2014). Appearance-based exercise motivation moderates the relationship between exercise frequency and positive body image. *Body Image,11*(2), 101-108. doi:10.1016/j.bodyim.2014.01.003

Kamimura, A., Christensen, N., Al-Obaydi, S., Solis, S. P., Ashby, J., Greenwood, J. L., & Reel, J. J. (2014). The relationship between body esteem, exercise motivations, depression, and social support among female free clinic patients. *Women's Health Issues,24*(6), 656-662. doi:10.1016/j.whi.2014.05.007

Kwan, B. M., & Bryan, A. D. (2010). Affective response to exercise as a component of exercise motivation: Attitudes, norms, self-efficacy, and temporal stability of intentions. *Psychology of Sport and Exercise,11*(1), 71-79. doi:10.1016/j.psychsport.2009.05.010

Leemrijse, C. J., Bakker, D. H., Ooms, L., & Veenhof, C. (2015). Collaboration of general practitioners and exercise providers in promotion of physical activity a written survey among general practitioners. *BMC Family Practice, 16*(1). doi:10.1186/s12875-015-0316-8

Lim, L., Seubsman, S., & Sleigh, A. (2008). Thai SF-36 health survey: Tests of data quality, scaling assumptions, reliability and validity in healthy men and women. *Health and Quality of Life Outcomes,6*(1), 52. doi:10.1186/1477-7525-6-52

Magnus, C. M., Kowalski, K. C., & McHugh, T. F. (2010). The role of self-compassion in women's self-determined motives to exercise and exercise-related outcomes. *Self and Identity,9*(4), 363-382. doi:10.1080/15298860903135073

Markland, D., & Ingledew, D. K. (1997). The measurement of exercise motives: Factorial validity and invariance across gender of a revised Exercise Motivations Inventory. *British Journal of Health Psychology,2*(4), 361-376. doi:10.1111/j.2044-8287.1997.tb00549.x

Miranda, A., Picorelli, A., Pereira, D., Felício, D., Anjos, D., Gomes, D., … & Pereira, L. (2014). Adherence of older women with strength training and aerobic exercise. *Clinical Interventions in Aging,9*, 323-331. doi:10.2147/cia.s54644

Mokhtari, S., Grace, B., Pak, Y., Reina, A., Durand, Q., & Yee, J. K. (2017). Motivation and perceived competence for healthy eating and exercise among overweight/obese adolescents in comparison to normal weight adolescents. *BMC Obesity,4*(1). doi:10.1186/s40608-017-0172-2

Nuttall, F. Q. (2015). Body mass index. *Nutrition Today,50*(3), 117-128. doi:10.1097/nt.0000000000000092

O'Brien, M. W., Shields, C. A., Oh, P. I., & Fowles, J. R. (2017). Health care provider confidence and exercise prescription practices of Exercise is Medicine Canada workshop attendees. *Applied Physiology, Nutrition, and Metabolism, 42*(4), 384-390. doi:10.1139/apnm-2016-0413

Patel, H., Alkhawam, H., Madanieh, R., Shah, N., Kosmas, C. E., & Vittorio, T. J. (2017). Aerobic vs anaerobic exercise training effects on the cardiovascular system. *World Journal of Cardiology,9*(2), 134. doi:10.4330/wjc.v9.i2.134

Pearson, E. S., & Hall, C. R. (2013). Examining body image and its relationship to exercise motivation: An 18-week cardiovascular program for female initiates with overweight and obesity. *Baltic Journal of Health and Physical Activity,5*(2). doi:10.2478/bjha-2013-0012

Ryan, R. M., & Deci, E. L. (2018). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York: The Guilford Press.

Silva, A. O., Diniz, P. R., Santos, M. E., Ritti-Dias, R. M., Farah, B. Q., Tassitano, R. M., … & Oliveira, L. M. (2018). Health self-perception and its association with physical activity and nutritional status in adolescents. *Jornal De Pediatria*. doi:10.1016/j.jped.2018.05.007

Silva, M. N., Markland, D., Carraça, E. V., Vieira, P. N., Coutinho, S. R., Minderico, C. S., ..., Teixeira, P. J. (2011). Exercise autonomous motivation predicts 3-yr weight loss in women. *Medicine & Science in Sports & Exercise,43*(4), 728-737. doi:10.1249/mss.0b013e3181f3818f

Silva, M., Marta, M., & Teixeira, P. (2014). Testing theory in practice: The example of self-determination theory-based interventions. *The European Health Psychologist, 16*(5), 171-180.

Teixeira, P. J., Going, S. B., Houtkooper, L. B., Cussler, E. C., Metcalfe, L. L., Blew, R. M., ..., & Lohman, T. G. (2006). Exercise motivation, eating, and body image variables as predictors of weight control. *Medicine & Science in Sports & Exercise,38*(1), 179-188. doi:10.1249/01.mss.0000180906.10445.8d

36-Item short form survey from the RAND medical outcomes study. (n.d.). Retrieved from https://www.rand.org/health-care/surveys_tools/mos/36-item-short-form.html

Tylka, T. L., & Wood-Barcalow, N. L. (2015). The Body Appreciation Scale-2: Item refinement and psychometric evaluation. *Body Image,12*, 53-67. doi:10.1016/j.bodyim.2014.09.006

U.S. Census Bureau QuickFacts: University Park city, Texas; Texas. (n.d.). Retrieved from https://www.census.gov/quickfacts/fact/table/universityparkcitytexas,TX/PST045218

Weight and obesity. (2018). Retrieved from https://www.womenshealth.gov/healthy-weight/weight-and-obesity

Yaman, H., & Atay, E. (2018). The effect of exercise prescription of primary care physician on the quality of life in patients. *London Journal of Primary Care, 10*(4), 93-98. doi:10.1080/17571472.2018.1464731

Zajac, A., & Schier, K. (2011). Body image dysphoria and motivation to exercise: A study of Canadian and Polish women participating in yoga or aerobics. *Archives of Psychiatry and Psychotherapy,4*, 67-72.

TABLES

Table 1

Godin Leisure-Time Exercise Questionnaire

Patient	Pre-Intervention	Post-Intervention
1A	21	50
1B	27	45
1D	35	48
1E	15	8
1F	23	17
1J	15	21
1K	51	57
1L	36	46
1N	30	26
1P	53	47
1Z	62	41
1X	30	36
1U	37	44
2B	31	27
N=14	Mean- 33.29	Mean- 36.64
	Std. Dev.- 13.986	Std. Dev.- 14.457

[a]Godin score calculated by tallying weekly exercise episodes in light, moderate, and strenuous categories then multiplying them by the metabolic equivalent of task (MET).
[b]Data were compared using a paired t-test.

Table 1

Exercise Motivation Inventory

Category	Pre-Intervention	Ranking	Post-Intervention	Ranking
Body Related Motives:				
Appearance	3.625	8	3.910	7
Weight Management	4.428	2	4.464	2
Health Motives:				
Health Pressures	1.592	14	1.830	14
Ill-Health Avoidance	4.021	4	4.067	5
Positive Health	4.450	1	4.665	1
Interpersonal Motives:				
Affiliation	2.500	11	2.392	11
Competition	1.964	13	2.107	13
Social Recognition	2.214	12	2.285	12
Fitness Motives:				
Nimbleness	2.712	10	3.258	10
Strength/Endurance	4.125	3	4.303	3
Psychological Motives:				
Enjoyment	3.714	7	4.160	4
Challenge	2.946	9	3.267	9
Revitalization	3.782	5	4.043	6
Stress Management	3.750	6	3.821	8

[a]The Exercise Motivation Inventory is a 51-item survey assessing sources of motivation using a 6-point (0-5) Likert type scale.

Table 3

Body Image and Quality of Life Inventory

Participant	**Pre-Intervention Score**	**Post-Intervention Score**
1A	-0.31578	2.31578
1B	-1.42105	-1.73684
1D	-1.52631	1.36842
1E	-2.42105	2.52631
1F	1.26315	1.8421
1J	-1	-0.52631
1K	0.26315	0.52631
1L	1.63157	1.89473
1N	-0.78947	1.31578
1P	1.36842	1.89473
1Z	0.57894	1.78947
1X	-1.0555	-0.68421
1U	0.15789	1.57894
2B	1.52631	1.78947
Mean	-0.1242	1.1353
	Sig	p=0.006 (a=0.05)

[a]The Body Image and Quality of Life Inventory survey utilizes a 7-point Likert type scale to assess body image.
[b]Data were compared using a paired t-test.

Table 4

RAND SF-36 Survey

Category	Pre-Intervention	Post-Intervention	Sig	t
Physical Functioning	95.000	98.214	.108	-1.727
Role Limitations d/t physical health	94.642	100.00	.189	-1.385
Role Limitations d/t emotional problems	66.665	78.569	.292	-1.099
Energy/Fatigue	53.214	68.214	.002	-3.758
Emotional Wellbeing	68.571	77.714	.006	-3.309
Social Functioning	85.714	90.178	.315	-1.046
Pain	81.785	93.571	.032	-2.409
General Health	72.857	80.714	.015	-2.797
		df= 13	a=0.05	

[a]Data were compared using a paired t-test.

FIGURES

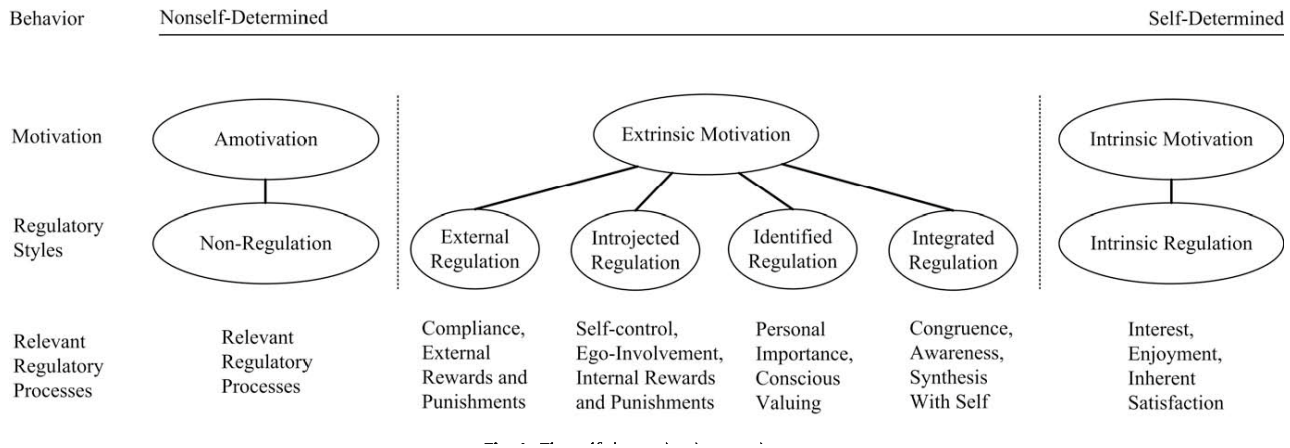
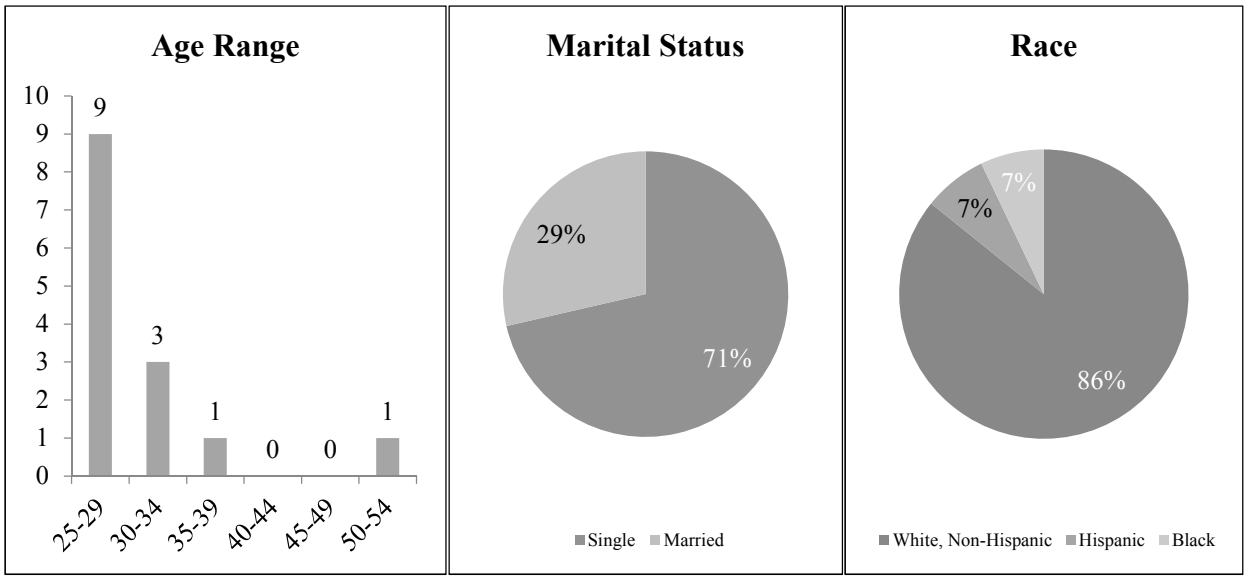
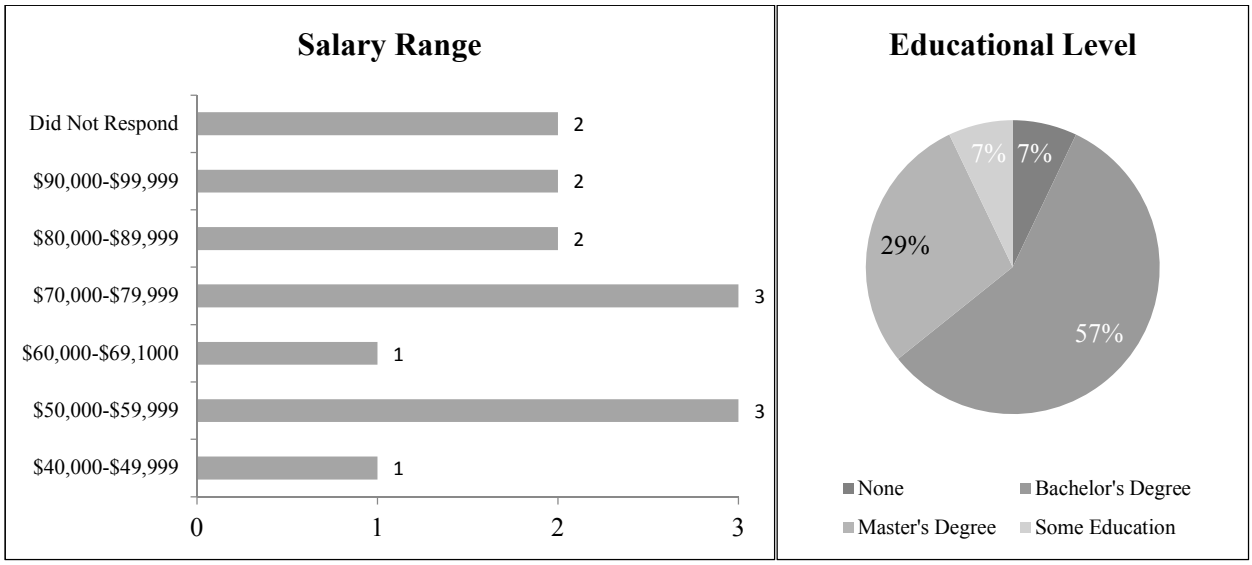


Figure 1. Self Determination Theory (Chen & Jang, 2010)



Age		Marital Status		Race	
Age Range	25-53	Single	71.4%	White, Non-Hispanic	85.7%
Mean Age	30.86	Married	28.6%	Hispanic	7.1%
				Black	7.1%

Figure 2. Demographics: age, marital status, race



Salary		Educational Level	
Salary Range	$40,000 - $90,000	None	7.1%
Average Salary	$69,169	Bachelor's Degree	57.1%
Median Salary	$70,000	Master's Degree	28.6%
		Some Education	7.1%

Figure 2. Demographics: salary, educational level

APPENDIX A

Project Timeline

Task	Projected Month/Year	Actual Month/Year
Email to clients	3/18/2019	2/21/2019
Responses	3/25/2019	3/7/2019
Notification of inclusion	3/25/2019	2/20/2019
Start of project	3/25/2019	3/8/2019
Completion date	5/20/2019	5/4/2019
Email to repeat survey	5/21/2019	4/28/2019
End of survey period	5/28/2019	5/11/2019
Manuscript	6/30/2019	6/14/2019
Defense	6/15/2019	6/14/2019

APPENDIX B

IRB Approval

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

☒ Expedited (see pg 2)
☐ Exempted (see pg 3)
☐ Full Review
☐ Extension of Approval

February 20th 2019

Shunkeetha Latrice Totsch
Department of Nursing
University of Alabama in Huntsville

Dear Mrs. Totsch,

The UAH Institutional Review Board of Human Subjects Committee has reviewed your proposal, *Effects of Increased Indoor Cycling Activity on the Exercise Motivation, Body Image, and Health Perception in the Adult Female Population,* and found it meets the necessary criteria for approval. Your proposal seems to be in compliance with this institutions Federal Wide Assurance (FWA) 00019998 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46).

Please note that this approval is good for one year from the date on this letter. If data collection continues past this period, you are responsible for processing a renewal application a minimum of 60 days prior to the expiration date.

No changes are to be made to the approved protocol without prior review and approval from the UAH IRB. All changes (e.g. a change in procedure, number of subjects, personnel, study locations, new recruitment materials, study instruments, etc) must be prospectively reviewed and approved by the IRB before they are implemented. You should report any unanticipated problems involving risks to the participants or others to the IRB Chair.

If you have any questions regarding the IRB's decision, please contact me.

Sincerely,

Bruce Stallsmith
IRB Chair
Professor, Biological Science

Expedited:

☐ Clinical studies of drugs and medical devices only when condition (a) or (b) is met. (a) Research on drugs for which an investigational new drug application (21 CFR Part 312) is not required. (Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risks associated with the use of the product is not eligible for expedited review. (b) Research on medical devices for which (i) an investigational device exemption application (21 CFR Part 812) is not required; or (ii) the medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.

☐ Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows: (a) from healthy, nonpregnant adults who weigh at least 110 pounds. For these subjects, the amounts drawn may not exceed 550 ml in an 8 week period and collection may not occur more frequently than 2 times per week; or (b) from other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8 week period and collection may not occur more frequently than 2 times per week.

☐ Prospective collection of biological specimens for research purposes by noninvasive means. Examples: (a) hair and nail clippings in a nondisfiguring manner; (b) deciduous teeth at time of exfoliation or if routine patient care indicates a need for extraction; (c) permanent teeth if routine patient care indicates a need for extraction; (d) excreta and external secretions (including sweat); (e) uncannulated saliva collected either in an unstimulated fashion or stimulated by chewing gumbase or wax or by applying a dilute citric solution to the tongue; (f) placenta removed at delivery; (g) amniotic fluid obtained at the time of rupture of the membrane prior to or during labor; (h) supra- and subgingival dental plaque and calculus, provided the collection procedure is not more invasive than routine prophylactic scaling of the teeth and the process is accomplished in accordance with accepted prophylactic techniques; (i) mucosal and skin cells collected by buccal scraping or swab, skin swab, or mouth washings; (j) sputum collected after saline mist nebulization.

☐ Collection of data through noninvasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications).

☐ Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

☐ Collection of data from voice, video, digital, or image recordings made for research purposes.

☒ Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Exempt

☐ Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (a) research on regular and special education instructional strategies, or (b) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods. The research is not FDA regulated and does not involve prisoners as participants.

☐ Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interviews, or observation of public behavior [1] in which information is obtained in a manner that human subjects cannot be identified directly or through identifiers linked to the subjects and any disclosure of the human subject's responses outside the research would NOT place the subjects at risk of criminal or civil liability or be damaging to the subject's financial standing, employability, or reputation. The research is not FDA regulated and does not involve prisoners as participants.

☐ Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement) survey procedures, interview procedures, or observation of public behavior if (a) the human subjects are elected or appointed public officials or candidates for public office, or (b) Federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter. The research is not FDA regulated and does not involve prisoners as participants.

☐ Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. The research is not FDA regulated and does not involve prisoners as participants.

☐ Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs;(iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs. The protocol will be conducted pursuant to specific federal statutory authority; has no statutory requirement for IRB review; does not involve significant physical invasions or intrusions upon the privacy interests of the participant; has authorization or concurrent by the funding agency and does not involve prisoners as participants.

☐ Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture. The research does not involve prisoners as participants.

[1] Surveys, interviews, or observation of public behavior involving children cannot be exempt.

APPENDIX C

Memorandum of Understanding

APPROVED: Amelia S Lacy
for Marsha Howell Adams, PhD, RN, CNE, ANEF, FAAN
Dean, College of Nursing

DATE: Oct 5, 2018

MEMORANDUM OF UNDERSTANDING
NURSING ADMINISTRATION EXPERIENCE

THIS MEMORANDUM OF UNDERSTANDING is made and entered into between The Board of Trustees of The University of Alabama, a public educational and constitutional instrumentality of the State of Alabama, incorporated by statute, for and on behalf of The University of Alabama in Huntsville (herein, the "University") and **The Ride House,** a Texas physical fitness facility located at 5600 W. Lovers Lane, Suite 100, Dallas, Texas 75209 (herein, the Agency).

W I T N E S S E T H:

WHEREAS, the University offers through its College of Nursing (herein, the "College") an accredited nursing education program, an important component of which are certain administrative experiences provided for nursing students in cooperation with health care and other appropriate agencies; and

WHEREAS, the Agency is willing to provide the nursing practice setting for such an administrative experience in association with the College; and

WHEREAS, the parties desire to state the terms of their cooperative association in a written agreement.

NOW, THEREFORE, in consideration of the mutual promises and covenants herein contained and other good and sufficient consideration, it is agreed by and between the parties as follows:

1. Cooperative Program. The Agency agrees to accept designated College Master of Science in Nursing (MSN) and Doctor of Nursing Practice (DNP) students as participants in a program of nursing administration instruction carried out as a cooperative effort by the University and the Agency. The program shall be designed to supplement and enhance the academic instruction provided in nursing courses by giving student participants administrative experience in health care delivery. Activities shall be selected by mutual agreement of the parties, based on the level of preparation and the educational needs of the student and the availability of appropriate opportunities at the Agency.

1

2. Assignment of Students to Program. The College shall designate and assign MSN/DNP students to this program. The Agency may, however, refuse a placement if it would unreasonably burden the Agency's resources. During the period of their respective assignments, students shall remain fully subject to the authority, policies, and regulations of the University.

3. Agency Policies and Rules. MSN/DNP student participants shall be required to comply with applicable policies and regulations of the Agency during the period of their assignment. The Agency shall have the responsibility of informing student participants and their faculty about such policies and regulations. Noncompliance by a student shall be a sufficient ground for termination of the student's participation in the administrative experience by either the Agency or the College.

4. Student Evaluation. The University retains the exclusive right to determine the grade to be received by the student for the assignment.

5. Coordination. The Agency and College will mutually agree on a qualified preceptor to guide the MSN/DNP student in the administrative experience. The University will designate a qualified faculty member to provide guidance for the administrative experience. The agency preceptor and faculty member will communicate in order to promote achievement of course objectives and resolve any questions in the course of the experience.

6. Non-Employee Status. The MSN/DNP students participating in this program shall not be considered employees of the Agency for any purpose under this Agreement, nor shall they be entitled to any compensation or other fee from the Agency for their services provided hereunder.

7. Emergency Treatment. To the extent that such treatment is available to its own employees, the Agency shall provide emergency treatment to MSN/DNP student participants for injury or illness occurring in the course of carrying out program activities at or about the Agency. Such treatment shall, however, be at the expense of the injured or ill individual. Further, the Agency shall notify the College's Dean of any incident involving a student participant which results in an incident report under the Agency's procedures. Faculty are not present so emergency care is not needed.

8. Insurance. The University shall require all the MSN/DNP students participating in this program to carry professional liability insurance covering their activities under the program provided for herein. Faculty insurance is not needed.

9. Termination. Either party shall have the right to terminate this Agreement at any time and without cause by giving to the other party ninety (90) days advance notice of termination in writing.

10. Term. This Agreement shall be effective as of the date of its execution. It shall continue in effect for eighteen (18) months at which time it shall be automatically renewed for a period of twelve (12) months unless either party shall have acted to terminate it in accordance with the provisions of paragraph 9. The Agreement shall be subject to annual renewal for

successive twelve (12) month periods without limitation in accordance with the provisions of this paragraph.

11. Compliance with Agency Policies. MSN/DNP students will comply with Agency requirements for infections control, privacy and confidentiality, and HIPAA.

12. Nondiscrimination. The University is committed to equal opportunity in employment and education. The University does not discriminate in any program or activity on the basis of race, color, religion, sex, age, or national origin, or against qualified handicapped or disabled persons, and it maintains an affirmative action program for protected minorities and women.

13. Entire Agreement. This Agreement states the entire agreement between the parties and merges herewith all statements, representations, and covenants heretofore made, and any other agreements not incorporated herein are void and of no effect. Any changes, modifications, or amendments to this Agreement must be reduced to and approved in writing by both parties.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed in duplicate originals by their duly authorized officers on the dates indicated herein below.

THE RIDE HOUSE

BY: _____
Parker Williams
Owner

Date: 9/28/18

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ALABAMA, FOR AND ON BEHALF OF THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

BY: Christine W. Curtis 10/10/18
Christine W. Curtis
Provost and Executive Vice President for Academic Affairs

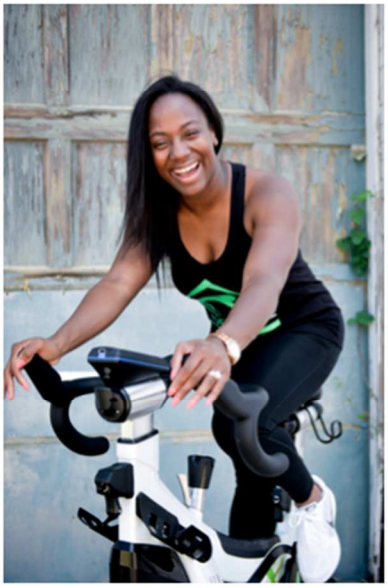
APPROVED BY OFFICE OF COUNSEL SAW 10-9-18

APPENDIX D

DNP Project Flyer

DOCTORATE OF NURSING PRACTICE

THE RIDEHOUSE
INDOOR CYCLING & FITNESS



Want FREE classes?!?! Our ROCKSTAR cycling instructor, Latrice, will be conducting an eight-week project exploring the effects of indoor cycling on body image, motivation and health perception for her doctorate degree. This opportunity is open to females over the age of 18 who exercise less than five hours a week. All levels of fitness accepted. If you participate, you'll get at least one free class a week for the duration of the project. Let's get Latrice to the cap and gown! Email her directly at slt0032@uah.edu to learn more!

UAH
The University of Alabama in Huntsville

APPENDIX E

IRB Approved Emails

First Response:

Thank you for your interest in participating in my doctorate project. In this project, I will be exploring the effects of indoor cycling on exercise motivation, body image, and health perception in the female population. To do this, I will ask the participants to complete several surveys that outline their current amount of physical exercise, perception of body image, health perception, and sources of motivation. For eight weeks, the participant will need to take at least one additional indoor cycling class, which will be free of charge for the duration of the project. The surveys will be redistributed at the end of the project. The information will be collected in a confidential manner. The results will be analyzed, disseminated, and displayed at The Ride House to promote the benefits of indoor cycling. The demographic/intake sheet, informed consent, participation log and surveys are attached to this email. Please return to me within **seven** days. I appreciate your willingness to devote your time to this project and help me reach my goal. Please see the following documents attached:

1.) Informed Consent- this document will outline the risks and benefits of the study, as well as your rights as a participant along with the contact information for the principal investigator. Please return this within **seven** days. If I do not receive this within the allotted time, I cannot include you in the project.
2.) Surveys- there are four surveys that should take less than thirty minutes to complete. Please print these and place them in the locked box at the front desk at The Ride House. There will be extra copies available at the desk.
3.) The projected start date of the project is: _____. Once the project has started, each week the participant will need to log their exercise minutes and place the log in the locked box at the front desk at The Ride House. See attached log. Please use the identification number provided in this email to provide confidentiality. **Do not write your name on these documents**.
4.) These surveys will need to be completed again at the end of the eight weeks. The end date for the project is: _____. All documents should be turned in within **seven** days of this date.

ID Number: _____

Thank you,

S. Latrice Totsch, MSN, APRN, FNP-C

-Demographic
-Informed Consent
-Surveys
-Participation log attached

Reminder Email- Last week:

Hello everyone,

We are starting the last week of the project! There is a light at the end of the tunnel. The final date of the project is : _____. Please complete the surveys attached to this email and leave in the locked box at the front desk within **seven** days of this date. Thank you for participating in my project. I appreciate all of your hard work and dedication. All identifying information provided will be disposed of properly once data is analyzed. If you have any further questions or concerns, please feel free to contact me directly.

Sincerely,

S. Latrice Totsch, MSN, APRN, FNP-C

-Surveys

APPENDIX F

Informed Consent

Effects of Increased Indoor Cycling Activity on Exercise Motivation, Body Image, and Health Perception in the Adult Female Population

INTRODUCTION

You are invited to join a research project to look at how an increase in cardiovascular exercise affects exercise motivation and health perception. The decision to join, or not to join, is a personal decision.

In this project, we are comparing how an increase in weekly cardiovascular exercise affects the client's perception of overall health and motivation to identify reasons a client might continue regular exercise. The principal investigator is S. Latrice Totsch, MSN, APRN, FNP-C, a cycling instructor at The Ride House. The faculty supervisor is Dr. Angela Hollingsworth, DNP, RN, CEN, NEA-BC. This project is being conducted to fulfill the requirements of the University of Alabama-Huntsville Doctorate of Nursing Practice degree program.

WHAT IS INVOLVED IN THE PROJECT?

If you decide to participate you will be asked to increase your weekly cardiovascular exercise by at least 45 minutes over an 8-week period. We think this will take you at least 45 minutes a week.

During the project, you will be asked to complete four surveys prior to the beginning of the eight-week observational period. These surveys or questionnaires will collect data on current activity level, sources of exercise motivation, body image and health perceptions. Each week, you will be responsible for completing an additional 45-minute indoor cycling class at the expense of the principal investigator. This will continue for an eight-week period. At the end of the eight weeks, you will be given the surveys again. It should take no longer than 15-30 minutes to complete all surveys.

The investigators may stop the project or take you out of the project at any time they judge it is in your best interest. They may also remove you from the project for various other reasons. They can do this without your consent.

You can stop participating at any time. If you stop you will not lose any benefits.

RISKS

We do not expect any risks, as this project does not involve any new or different physical activities that you are not already used to. However, there is minimal risk of physical injury. This project involves the following risks: physical injury, fatigue, physical stress, discomfort, pain. In the event of an injury, the participant is responsible for their own medical costs if an assessment of the injury by a medical professional is needed.

There may also be other risks that we cannot predict.

BENEFITS TO TAKING PART IN THE PROJECT?

It is reasonable to expect the following benefits from this project: improvement in cardiovascular health, ability to interact with like minded people with a focus on improving overall mental and physical health, possible decrease in stress and/or anxiety or improvement in mood. However, we can't guarantee that you will personally experience benefits from participating in this project. Others may benefit in the future from the information we find in this project.

CONFIDENTIALITY

We will take the following steps to keep information about you confidential, and to protect it from unauthorized disclosure, tampering, or damage:

List all individuals and agencies who will have access to the data and records, and how data will be described if published or shared with others. All information submitted with either be contained within a locked box for which only the principal investigator possesses the key, or will kept on a password encrypted file.

Describe confidentiality protections here. Explain how you are protecting the subject's information. Give details as appropriate: for example, are data files kept in locked cabinets, are the data kept on a computer, is a password required for getting onto the system; who has access to the data, etc.

INCENTIVES

One additional weekly class will be free during the duration of the 8-week project.

YOUR RIGHTS AS A PROJECT PARTICIPANT?

Participation in this project is voluntary. You have the right not to participate at all or to leave the project at any time. Deciding not to participate or choosing to leave the project will not result in any penalty or loss of benefits to which you are entitled, and it will not harm your relationship with the principal investigator.

If you wish to withdraw from the project, please contact the principal investigator via email: sltotsch@gmail.com.

CONTACTS FOR QUESTIONS OR PROBLEMS?

Call S. Latrice Totsch, MSN, APRN, FNP-C at 214-641-0218 or email at sltotsch@gmail.com. if you have questions about the project, any problems, unexpected physical or psychological discomforts, any injuries, or think that something unusual or unexpected is happening. You may also contact the faculty supervisor Dr. Angela Hollingsworth, DNP, RN, CEN, NEA-BC at 256-824-6516 or email at Angela.Hollingsworth@uah.edu.

Consent of Subject (or Legally Authorized Representative)

Signature of Subject or Representative Date

_____

Upon signing, the subject or the legally authorized representative will receive a copy of this form, and the original will be held in the subject's research record.

APPENDIX G

Exercise Motivation Intake Form (Demographics)

Exercise Motivation Intake Form

Effects of Increased Indoor Cycling Activity on Exercise Motivation and Health Perception in the Adult Female Population

A DNP Project by S. Latrice Totsch, MSN, APRN, FNP-C

Name: _____

Age: _____

Marital Status (circle one): Single Married Widowed Divorced Separated Registered Partnership

Race (circle one): American Indian/Alaska Native Asian Black/African American Hispanic/Latino Native Hawaiian/Other Pacific Islander White

Highest Education Level Completed (circle one): High School Some College Associate's Degree Bachelor's Degree Master's Degree Doctoral Degree

Salary: _____

Occupation: _____

Exercise of Choice: _____

Injuries: _____

Medical History: _____

Average Minutes of Exercise Weekly: _____

Height: _____ ft _____ in

Weight: _____ lbs.

*** For Internal Use Only ***

ID #

APPENDIX H

Godin Leisure-Time Exercise *Questionnaire*

During a typical **7-Day period** (a week), how many times on the average do you do the following kinds of exercise for **more than 15 minutes** during your free time (write on each line the appropriate number).

Weekly leisure activity score = (9 × Strenuous) + (5 × Moderate) + (3 × Light)

	Times per week		Totals
a) **STRENUOUS EXERCISE (HEART BEATS RAPIDLY)** (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)		**X9**	
b) **MODERATE EXERCISE (NOT EXHAUSTING)** (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)		**X5**	
c) **MILD/LIGHT EXERCISE (MINIMAL EFFORT)** (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)		**X3**	
WEEKLY LEISURE-TIME ACTIVITY SCORE			

EXAMPLE
Strenuous = **3** times/wk
Moderate = **6** times/wk
Light = **14** times/wk
Total leisure activity score = (9 × **3**) + (5 × **6**) + (3 × **14**) = 27 + 30 + 42 = 99

Godin Scale Score	Interpretation
24 units or more	Active
14 – 23 units	Moderately Active
Less than 14 units	Insufficiently Active/Sedentary

Adapted from: Godin, G. (2011). The Godin-Shephard leisure-time physical activity questionnaire. Health & Fitness Journal of Canada, 4(1), 18-22.

ONS® Oncology Nursing Society

APPENDIX I

RAND HEALTH

RAND > RAND Health > Surveys > RAND Medical Outcomes Study > 36-Item Short Form Survey (SF-36) >

36-Item Short Form Survey Instrument (SF-36)

RAND 36-Item Health Survey 1.0 Questionnaire Items

Choose one option for each questionnaire item.

1. In general, would you say your health is:

- 1 - Excellent
- 2 - Very good
- 3 - Good
- 4 - Fair
- 5 - Poor

---

2. **Compared to one year ago**, how would you rate your health in general **now**?

- 1 - Much better now than one year ago
- 2 - Somewhat better now than one year ago
- 3 - About the same
- 4 - Somewhat worse now than one year ago
- 5 - Much worse now than one year ago

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	○ 1	○ 2	○ 3
4. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	○ 1	○ 2	○ 3
5. Lifting or carrying groceries	○ 1	○ 2	○ 3
6. Climbing **several** flights of stairs	○ 1	○ 2	○ 3
7. Climbing **one** flight of stairs	○ 1	○ 2	○ 3
8. Bending, kneeling, or stooping	○ 1	○ 2	○ 3
9. Walking **more than a mile**	○ 1	○ 2	○ 3
10. Walking **several blocks**	○ 1	○ 2	○ 3
11. Walking **one block**	○ 1	○ 2	○ 3
12. Bathing or dressing yourself	○ 1	○ 2	○ 3

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

	Yes	No
13. Cut down the **amount of time** you spent on work or other activities	○ 1	○ 2
14. **Accomplished less** than you would like	○ 1	○ 2
15. Were limited in the **kind** of work or other activities	○ 1	○ 2
16. Had **difficulty** performing the work or other activities (for example, it took extra effort)	○ 1	○ 2

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

	Yes	No
17. Cut down the **amount of time** you spent on work or other activities	○ 1	○ 2
18. **Accomplished less** than you would like	○ 1	○ 2
19. Didn't do work or other activities as **carefully** as usual	○ 1	○ 2

20. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

- ○ 1 - Not at all
- ○ 2 - Slightly
- ○ 3 - Moderately
- ○ 4 - Quite a bit
- ○ 5 - Extremely

21. How much **bodily** pain have you had during the **past 4 weeks**?

- 1 - None
- 2 - Very mild
- 3 - Mild
- 4 - Moderate
- 5 - Severe
- 6 - Very severe

---

22. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

- 1 - Not at all
- 2 - A little bit
- 3 - Moderately
- 4 - Quite a bit
- 5 - Extremely

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks**...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
23. Did you feel full of pep?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
24. Have you been a very nervous person?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
25. Have you felt so down in the dumps that nothing could cheer you up?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
26. Have you felt calm and peaceful?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
27. Did you have a lot of energy?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
28. Have you felt downhearted and blue?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
29. Did you feel worn out?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
30. Have you been a happy person?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
31. Did you feel tired?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6

32. During the **past 4 weeks**, how much of the time has **your physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

- ○ 1 - All of the time
- ○ 2 - Most of the time
- ○ 3 - Some of the time
- ○ 4 - A little of the time
- ○ 5 - None of the time

How TRUE or FALSE is **each** of the following statements for you.

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
33. I seem to get sick a little easier than other people	○ 1	○ 2	○ 3	○ 4	○ 5
34. I am as healthy as anybody I know	○ 1	○ 2	○ 3	○ 4	○ 5
35. I expect my health to get worse	○ 1	○ 2	○ 3	○ 4	○ 5
36. My health is excellent	○ 1	○ 2	○ 3	○ 4	○ 5

APPENDIX J

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

	Personally, I exercise (or might exercise) …	Not at all true for me					Very true for me
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

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

APPENDIX K

The BIQLI Questionnaire

Instructions: Different people have different feelings about their physical appearance. These feelings are called "body image." Some people are generally satisfied with their looks, while others are dissatisfied. At the same time, people differ in terms of how their body-image experiences affect other aspects of their lives. Body image may have positive effects, negative effects, or no effect at all. Listed below are various ways that your own body image may or may not influence your life. For each item, circle how and how much your feelings about your appearance affect that aspect of your life. Before answering each item, think carefully about the answer that most accurately reflects how your body image usually affects you.

-3	-2	-1	0	+1	+2	+3
Very Negative Effect	Moderate Negative Effect	Slight Negative Effect	No Effect	Slight Positive Effect	Moderate Positive Effect	Very Positive Effect

1.	My basic feelings about myself—feelings of personal adequacy and self-worth.	-3	-2	-1	0	+1	+2	+3
2.	My feelings about my adequacy as a man or woman—feelings of masculinity or femininity.	-3	-2	-1	0	+1	+2	+3
3.	My interactions with people of my own sex.	-3	-2	-1	0	+1	+2	+3
4.	My interactions with people of the other sex.	-3	-2	-1	0	+1	+2	+3
5.	My experiences when I meet new people.	-3	-2	-1	0	+1	+2	+3
6.	My experiences at work or at school.	-3	-2	-1	0	+1	+2	+3
7.	My relationships with friends.	-3	-2	-1	0	+1	+2	+3
8.	My relationships with family members.	-3	-2	-1	0	+1	+2	+3
9.	My day-to-day emotions.	-3	-2	-1	0	+1	+2	+3
10.	My satisfaction with my life in general.	-3	-2	-1	0	+1	+2	+3

-3	-2	-1	0	+1	+2	+3
Very Negative Effect	Moderate Negative Effect	Slight Negative Effect	No Effect	Slight Positive Effect	Moderate Positive Effect	Very Positive Effect

11.	My feelings of acceptability as a sexual partner.	-3	-2	-1	0	+1	+2	+3
12.	My enjoyment of my sex life.	-3	-2	-1	0	+1	+2	+3
13.	My ability to control what and how much I eat.	-3	-2	-1	0	+1	+2	+3
14.	My ability to control my weight.	-3	-2	-1	0	+1	+2	+3
15.	My activities for physical exercise.	-3	-2	-1	0	+1	+2	+3
16.	My willingness to do things that might call attention to my appearance.	-3	-2	-1	0	+1	+2	+3
17.	My daily "grooming" activities (i.e., getting dressed and physically ready for the day).	-3	-2	-1	0	+1	+2	+3
18.	How confident I feel in my everyday life.	-3	-2	-1	0	+1	+2	+3
19.	How happy I feel in my everyday life.	-3	-2	-1	0	+1	+2	+3

APPENDIX L

Participant Activity Log

Effects of Increased Indoor Cycling Activity on Exercise Motivation, Body Image, and Health Perception in the Adult Female Population

A DNP Project by S. Latrice Totsch, MSN, APRN, FNP-C

ID#_____

Week of _____ (Example: February 10-17)

Please list classes, sessions, and workouts below with corresponding minutes of exercise for each session.

Indoor Cycling	Other Cardiovascular Activity	Total Number of Minutes for the Week

APPENDIX M

Title: The effects of indoor cycling on body image, motivation, and health perception in women

Author:
S. Latrice Totsch, MSN, APRN, FNP-C, University of Alabama-Huntsville, student, 301 Sparkman Dr NW, Huntsville, AL 35899, slt0032@uah.edu

Angela Hollingsworth, DNP, RN, CEN, NEA-BC, University of Alabama-Huntsville, professor, 301 Sparkman Dr NW, Huntsville, AL 35899, ah0109@uah.edu

Autumn Spence, DNP, ANP-BC, drautumnspence@gmail.com

Affiliations:
None

Declarations of interest:
None

Corresponding author: S. Latrice Totsch

Permanent Address:
8911 Rolling Rock Ln.
Dallas, Texas 75238

Highlights:

- An increase in cardiovascular exercise, specifically in indoor cycling, improved body image
- An increase in cardiovascular exercise, specifically in indoor cycling, improved the following areas of health perception: energy, emotional well-being, pain, and general health categories.
- Exercise motivation remained stable during the study.
- Indoor cycling is a good source of cardiovascular exercise to improve body image and health perception.

Abstract

Purpose: The purpose of the study was to analyze the relationship between an increase in indoor cycling activity and exercise motivation, health perception, and body image within the female population.

Background and Significance: Obesity is strongly linked to medical conditions such as heart disease, hypertension, cardiovascular accidents, and diabetes. Research shows that cardiovascular exercise can help prevent these conditions. However, barriers to exercise such as a lack of motivation, body image concerns, and a negative health perception can inhibit patients from commit to regular exercise. Providers are responsible for creating individualized plans that consider these barriers to improve compliance.

Design: Pre-test-post-test design. Fourteen females participated in an eight-week study that required an increase in indoor cycling minutes based on the Self Determination Theory to identify changes in exercise motivation, body image, and health perception.

Findings: Participants showed improvements in body image from pre-test to post-test ($p<0.05$). Health perception also showed improvement in the following categories: energy, emotional well-being, pain, and general health. Exercise motivation remained stable pre and post-test, with the primary sources of motivation being strength and endurance, weight management, and positive health measures.

Conclusion: Study results confirmed that indoor cycling improves health perception and body image with consistency in exercise motivation, therefore, proving to be a good source of cardiovascular exercise to help reduce barriers while potentially lowering risks of cardiovascular disease, diabetes, and stroke.

Keywords: cardiovascular exercise, indoor cycling, motivation, body image, health perception

1. Introduction

According to statistics published by the Centers for Disease Control (2018), obesity affects approximately 39.8% of adults in America. Each year in the United States, 147 billion health care dollars is spent caring for obese and overweight patients. These funds are utilized to treat and manage comorbidities that have a connection with obese and overweight patients. A total of 71.6% of Americans age 20 or older are considered to be overweight or obese. The cause of obesity is a multifactorial phenomenon that includes environmental, psychological, and physical influences (Apovian, 2016).

Since a sedentary lifestyle can contribute to becoming overweight and obese, regular exercise as a source of prevention should be strongly encouraged by health care providers to combat this. Research has shown that regular exercise has benefits, even in those who are not overweight or obese. The American Heart Association (2018) states cardiovascular exercise can improve cardiorespiratory performance, sleep, cognition and promote better bone health, and improve depression or anxiety. Sources of motivation highly regulate participation in exercise. These sources can come from internal or external factors. Having a clear understanding of what motivates a person to exercise regularly, maintain a positive body image, health perception, and health behaviors is essential in creating an individualized plan of care that take barriers and challenges into consideration to improve compliance and promote long-term success.

Exercise motivation is a complex concept that has defined as “the intrinsic determination toward goal attainment” (Plonczynski, 2000). Thus, exercise motivation is the crux of health behavior and adherence to consistent participation in cardiovascular exercise (Plonczynski, 2000). Sources for motivation are derived from external or internal factors. The Self Determination Theory suggests that motivation exists on a continuum and is affected by varying

degrees of autonomy (Duncan, Hall, Wilson, & O, 2010). By identifying sources of exercise motivation and understanding how it contributes to exercise behavior, providers will be able to increase exercise in the individuals they serve to promote positive health behaviors (Duncan, Hall, Wilson, & O, 2010).

Health perception can be perceived as an individual's view of wellness and illness when self-evaluating the presence of impairments that are not limited to those of only the physical nature. Mood, physical or mental impairments, environment, and culture can impact health perception. A negative perception of health creates barriers to achieving goals. Studies have shown that there is a strong correlation between positive health perception and the participation of physical activity (Silva et al., 2018).

The definition of body image is the subjective perception of one's physical appearance, which can be either positive or negative (Brudzynski & Ebben, 2010). A negative or poor body image is linked with an increase in depression and eating disorders (Stevens et al., 2016). Those who engage in regular physical activity tend to have a better perception of their body image (Korn, Gonen, Shaked, & Golan, 2013). Females, specifically, tend to have a more negative perception of themselves than their male counterparts (Korn, Gonen, Shaked, & Golan, 2013). Women were chosen as the focus of this study because of this research.

Media in the United States uses television, internet, newspapers, and magazines to portray the perceived ideal female body image. The overuse of such images, along with the lack of diversity and inclusion of others, promotes internalization of negative thoughts and feelings, therefore, fostering a negative body image (Freitas, Jordan, & Hughes, 2018). In a social media driven culture, platforms such as Facebook, Snapchat, and Instagram reinforce these thoughts (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015). In an already venerable demographic, these

platforms create an environment of social comparison that can worsen or create body dissatisfaction and disordered eating (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015).

Indoor cycling is a cardiovascular exercise that has gained attention throughout the years because of its proven ability to assist with weight loss. When used in conjunction with a reduced calorie diet, clients can decrease body weight and change their body composition (Muyor, 2013). Indoor cycling is quite an inclusive activity. People of different body types, ages, and fitness levels can participate in an instructor-led class (Muyor, 2013). These types of classes are widely available at gyms and studios across the United States. The effort required to complete a cycling class is a mix of moderate and vigorous intensity as proven in multiple recent studies (Battista et al., 2008). This is important because by participating in this exercise at a vigorous level, the patient can spend less time working out for the same benefit.

The current study aimed to investigate the effects of indoor cycling on exercise motivation, body image, and health perception. Because women are more likely to struggle with body image and body dissatisfaction issues, they were the population of focus (Hogue & Mills, 2019). We hypothesized that an increase in exercise minutes, specifically in indoor cycling, would positively effect health perception and body image. We also hypothesized that there would be a shift in the top sources of motivation.

2. Method

2.1 Participants

The initial sample consisted of 19 participants. Five participants were unable to adhere to requirements and were excluded from analysis leaving a final sample of 14. All participants were female and over the age of 18 (N=14, M age= 30.86, SD= 7.08, age range: 25-53). Of these participants, 71.4% were single, 28.6% were married. The majority of the participants identified

as white, non-Hispanic at 85.7%. The remaining breakdown included 7.1% for both Hispanic and black participants. Information regarding salary and education level was collected because both of these were referenced in literature when identifying possible barriers to positive health behaviors. The median salary of all participants that submitting this information was $69,169 (Median= $70,000, SD= $16,244, range: $40,000-$90,000). Most participants had higher education: some college- 7.1%, Bachelor's degree- 57.1%, Master's degree- 28.6%, None- 7.1%.

2.1.2 Procedures

The principal investigator obtained approval of this study from the Institutional Research Board at the University of Alabama-Huntsville. Testing was conducted from March 8, 2019 to May 4, 2019. Only female clients 18-year-old or older completing less than 300 minutes of exercise a week were eligible. Participants were recruited using flyers placed inside the studio over a one-week period. Participants provided informed consent prior to the start of the study. All questionnaires and the participation exercise log were provided via email. Each week, the participants took at least one additional 45-minute indoor cycling class from the baseline reported on the Godin Leisure-Time Exercise Questionnaire. The participant was also responsible for reporting their weekly exercise minutes at the end of each week by depositing a reporting form using their assigned alphanumeric identification number into a locked box at the desk. The participants were free to take any instructor they wished to take for the convenience of schedules. After the eight weeks, the surveys were completed again and submitted.

2.3 Measures

2.3.1 Godin Leisure-Time Exercise Questionnaire

The Godin Leisure-Time Exercise Questionnaire is a short questionnaire that allows the participant's activity level to be converted into statistical data (Duncan, Hall, Wilson, & O,

2010). The participant indicated the frequency and intensity of exercise (Duncan, Hall, Wilson, & O, 2010). A composite score is established and converted into a weekly activity score (Duncan, Hall, Wilson, & O, 2010). Validity and reliability of this tool have been established in active and inactive adults (Amireault & Godin, 2015). According to established guidelines, a score equal to or greater than 24 is considered active (Amireault & Godin, 2015). A score of 23 or less is considered insufficiently active (Amireault & Godin, 2015).

2.3.2 Exercise Motivation Inventory-2

The Exercise Motivation Inventory-2 survey is a 51-item survey used to assess exercise motivations by using Likert scales (Kamimura et al., 2014). There are five subgroups and 14 subscales (Kamimura et al., 2014). These assess for psychological, social, health-related, weight-related, and physical strength-related motivation (Kamimura et al., 2014). This tool has been proven to be valid and reliable for assessing exercise motives across different populations (Markland & Ingledew, 1997).

2.3.3 RAND SF-36 Short Form

The RAND SF-36 Short Form survey uses eight concepts to explore health perception. These concepts include physical ability, pain, limitations due to health conditions, limitations due to personal or emotional distress, social functioning, energy level, and general health perceptions (Hays, Sherbourne, & Mazel, 1993). The short form survey was adapted from the Medical Outcomes Study (MOS) completed in 1992 (Hays, Sherbourne, & Mazel, 1993). The RAND SF-36 survey has been used to assess the changes of many populations with a focus on those with chronic illnesses. However, its reliability and validity were confirmed in a Thai study that included healthy males and females (Lim, Seubsman, & Sleigh, 2008). Limited recent data is

available to verify similar findings in a study that uses the English language RAND SF-36 Short Form survey tool.

2.3.4 Body Image Quality of Life Inventory

Dr. Thomas Cash developed the Body Image Quality of Life Inventory in 2002 (Cash & Fleming, 2002). This tool assesses body image, psychosocial functioning, and how these things affect an individuals' quality of life (Cash & Fleming, 2002). This tool explores 19 life domains on a 7-point response scale. Some of the domains explored include a sense of self, social interaction, sexuality, emotional well-being, and exercise (Cash, n.d.). The Body Image Quality of Life Inventory tool has been verified to be internally consistent and stable over a two to three-week period in a 2002 study (Cash & Fleming, 2002). The validity and reliability have been proven in female populations but more research may be necessary for male counterparts and older adult populations (Cash & Fleming, 2002).

2.3.5 Data Analysis

Due to the test-retest format of the study, a pair T-test was used to examine differences between pre-test and post-test results. SPSS software was used to analyze data. Results were considered statistically significant at the a=0.05 level. It is expected that the post-test results are higher than the pre-test results.

3 Results

3.1 Godin Leisure-Time Exercise Questionnaire

The Godin Leisure-Time Exercise Questionnaire is a self-administered questionnaire that gathers information on the number of times the participant engages in different levels of exercise during a typical seven-day period. Three options are provided: mild (minimal effort: yoga, easy walking), moderate (not exhausting: easy swimming, dancing, easy cycling), strenuous (heart

beats rapidly: vigorous cycling and swimming) (Amireault & Godin, 2015). Each score of the individual categories is then multiplied by a corresponding Metabolic Equivalent of Task or MET (Amireault & Godin, 2015). The cumulative sum of each category is the total Godin score. The pre-intervention Godin scores averaged 33.29 (SD- 13.986, range: 15-62). The post-intervention Godin scores averaged 36.64 (SD- 14.457, range 8-57). This correlates to a p-value of 0.333, $t(13)= -1.024$, which is not a statistically significant difference.

3.2 Exercise Motivation Inventory-2 Survey

The Exercise Motivation Inventory 2 Survey is a 51-item questionnaire that explores the sources of motivation to participate in regular exercise. These items can be separated into five submodels (Body Related Motives, Health Motives, Interpersonal Motives, Fitness Motives, Psychological Motives), followed by fourteen categories relating to those submodels (Appearance, Weight Management, Health Pressures, Ill-Health Avoidance, Positive Health, Affiliation, Competition, Social Recognition, Nimbleness, Strength and Endurance, Enjoyment, Challenge, Revitalization, and Stress Management) (Markland & Ingledew, 1997). Participants were asked to indicate whether each statement was true or not true using a six-point (0-5) Likert type scale (Markland & Ingledew, 1997).

The pre-intervention scores showed that the top four sources of motivation were ill-health avoidance, strength and endurance, weight management, and positive health measures. Similarly, the top three sources remained the same in the post-intervention scores. However, the fourth source shifted to enjoyment instead of positive health measures, which is significant seeing as this is an intrinsic source of motivation. An increase in intrinsic motivation is the strongest predictor of long-term results such as adherence and continued participation in a particular program (Pearson & Hall, 2013). See Table 1 for the Exercise Motivation Inventory results.

The lowest ranking category was Health Pressures. The questions in this category were "because my doctor advised me to exercise," "to prevent an illness that runs in my family," and "to recovery from an illness/injury."

3.3 Body Image and Quality of Life Inventory

The Body Image and Quality of Life Inventory measures the impact body image has on one's life. This scale thoroughly measures how the participant's current body image affects their emotional state, activities, relationships, and sexual experiences (Cash & Fleming, 2002). It is a 7-point scale ranging from -3 to +3, therefore allowing for negative and positive ratings (Cash & Fleming, 2002). The scoring includes adding each item and averaging them by the number of items in the survey.

A paired T-test was used to analyze the data collected pre and post-intervention. The mean pre-intervention score was -0.1242 (SD= 1.2925). The mean post-intervention score was 1.1353 (SD= 1.2652). The SPSS analysis revealed p= .006 (a=0.05), t(13)= -3.284, which is a statistically significant change. These results prove that the increased amount and intensity of exercise positively affected the participant's body image and the effects it had in their personal lives.

3.4 RAND SF-36 Survey

The RAND SF-36 survey is a 36-item survey of questions to assess the quality of life. The eight health concepts measures are physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal and emotional problems, general mental health, social functioning, energy and fatigue, and general health (Hays, Sherbourne, & Mazel, 1993). Precoded numeric values were recoded according to the scoring recommendations. Each item was scored ranging from 0-100. The higher the score, the

more favorable the state of health is considered. The items of the categories were averaged together to produce the scores in Table 2.

SPSS software was used to analyze the data collected. A paired t-test compared the pre and post-intervention scores. Physical functioning, role limitations due to physical health, role limitations due to emotional problems, and social functioning results were not statistically significant. However, the p values of the following categories were less than 0.05; therefore, there was a significant change from the pre and post-intervention scores: energy ($p=.002$, $t(13)= -3.758$), emotional well-being ($p= .006$, $t(13)= -3.309$), pain ($p= .032$, $t(13)= -2.409$), and general health ($p= .015$, $t(13)= -2.797$).

4 Discussion

The purpose of the study was to identify whether an increase in cardiovascular exercise, specifically from indoor cycling, would affect exercise motivation, body image, and health perception in the female population over eight weeks. Considering the steady rise in overweight and obese individuals, identifying sources of motivation to exercise regularly is important. Providers should seek a broader knowledge of the barriers to positive health behaviors. Although there are plenty of obstacles, two of the barriers this study focuses on are body image and health perception. Since women are at an increased risk for disordered eating and body image issues from constant media exposure to images that induce a comparative nature, they were the population focus of this study. The study sought to identify the main sources of motivation and whether an increase in cardiovascular exercise, specifically indoor cycling, could improve body image and health perceptions. This information could provide evidence that may be utilized in everyday practice by healthcare providers when developing an individualized plan for patients.

Preventative medicine should be at the forefront of practice. It is well documented that physically active persons are less likely to suffer from hyperlipidemia, hypertension, stroke, and coronary artery disease (Yaman & Atay, 2018). Providers have the unique duty to address potential risks for these issues and promote regular exercise to decrease these risks (Yaman & Atay, 2018). Lack of motivation and barriers to regularly participating in cardiovascular exercise should be addressed accordingly so a plan can be developed that promotes success. These barriers can be perceived, mental, and/or physical and are very valid to the patient. In addition to a lack of motivation, the patient's perception of health and body image can also affect their ability to continue with exercise. With the findings noted in this study, healthcare providers can focus on developing goals that focus on the top three sources of motivation: strength and endurance, weight management, and positive health measures. Individual goals can be developed for each category as a collaborative effort between the healthcare provider and the patient. A collaborative approach, coupled with an exercise prescription from the provider may yield long-lasting results. Although the results of this study did not reflect this, it has been proven that exercise prescriptions increase physical activity in patients (Yaman & Atay, 2018). The data from this study proves that by increasing physical exercise we can, in turn, improve body image and the patient's perception of health creating positive health behaviors that result in a decrease in disease, disorders, and mortality.

Limitations and considerations should be assessed and evaluated for every study in order to identify elements that impacted or influenced the results and a possible need for further research. Although an increase in cardiovascular exercise yielded positive outcomes, the results would have been more robust and reliable if there was a control group for comparison. Nevertheless, the lack of a control group does not invalidate these findings.

Another consideration that would need further investigation would be the effect of the intensity of exercise on motivation, health perception, and body image. This consideration was sparked by the results of the Godin Leisure-Time Exercise Questionnaire considering there wasn't a significant increase in the exercise score. Instead, an increase in intensity yielded a change in body image and some aspects of health perception.

The majority of the participants were white non-Hispanic, possessed a college education, and had a median annual salary of $70,000, which is significantly higher than the average median salary of $31,610 (Fontenot, Semega, & Kollar, (2018). The Ride House is located in an affluent area of Dallas, Texas referred to as University Park. According to the United States Census Bureau (n.d.), the median household income is $211,741 and the median home value in this area is 1.19 million dollars. This is not an area that reflects the average demographics of the United States. Research has shown that those of a lower income are less likely to spend time exercising regularly (Kamimura et al., 2014). Repeating this program with a larger sample size that would include a more diverse demographic may yield different results because people of different races or ethnicities, education level, and salary level may have a different set of barriers, mental and emotional challenges, access to resources and perceptions of self and health.

Finally, qualitative data would have been useful to further explain if there were external factors outside of an increase in indoor cycling that affected the results of the surveys. Commentary about how the participants overcame certain barriers, what they considered personal barriers, what led to a shift in intensity of exercise, or an inability to continue with a program would be helpful to understand how these things affected the outcome of the results. Furthermore, qualitative data might help answer the question of how increasing the intensity of

exercise alone, instead of frequency, relates to an improvement in body image and health perception.

To the principal investigator's knowledge, this is the first study with a focus on indoor cycling as the cardiovascular exercise of choice. Since this is a unique study, the correlation between motivation, body image, and health perceptions with indoor cycling was unknown. The results of the study proved that with an increase in cardiovascular exercise, specifically indoor cycling, body image was improved along with the health perception of the participants. Motivation to complete exercise remained stable across eight weeks, therefore, providing useful data as a base for creating an exercise plan rooted in the most common sources of motivation expressed by the participants.

Reference

American Heart Association recommendations for physical activity in adults and kids. (2018). Retrieved from https://www.heart.org/en/healthy-living/fitness/fitness-basics/aha-recs-for-physical-activity-in-adults

Amireault, S., & Godin, G. (2015). The Godin-Shephard Leisure-Time Physical Activity Questionnaire: Validity evidence supporting its use for classifying healthy adults into active and insufficiently active categories. *Perceptual and Motor Skills,120*(2), 604-622. doi:10.2466/03.27.pms.120v19x7

Apovian, C. M. (2016). Obesity: Definition, comorbidities, causes, and burden. Retrieved from https://www.ajmc.com/journals/supplement/2016/impact-obesity-interventions-managed-care/obesity-definition-comorbidities-causes-burden?p=1

Battista, R. A., Foster, C., Andrew, J., Wright, G., Lucia, A., & Porcari, J. P. (2008). Physiologic responses during indoor cycling. *Journal of Strength and Conditioning Research,22*(4), 1236-1241. doi:10.1519/jsc.0b013e318173dbc4

Brudzynski, L., & Ebben, W. (2010). Body image as a motivator and barrier to exercise participation. *International Journal of Exercise Science, 3*(1).

Cash, T. (n.d.). Body image assessments: BIQLI. Retrieved from http://www.body-images.com/assessments/biqli.html

Cash, T. F., & Fleming, E. C. (2002). The impact of body image experiences: Development of the body image quality of life inventory. *International Journal of Eating Disorders,31*(4), 455-460. doi:10.1002/eat.10033

Centers for Disease Control and Prevention: Overweight & obesity. (2018). Retrieved from https://www.cdc.gov/obesity/data/adult.html

Duncan, L. R., Hall, C. R., Wilson, P. M., & O, J. (2010). Exercise motivation: A cross-sectional analysis examining its relationships with frequency, intensity, and duration of exercise. *International Journal of Behavioral Nutrition and Physical Activity,7*(1), 7. doi:10.1186/1479-5868-7-7

Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image,13*, 38-45. doi:10.1016/j.bodyim.2014.12.002

Fontenot, K., Semega, J., & Kollar, M. (2018). Income and poverty in the United States: 2017. Retrieved from https://www.census.gov/library/publications/2018/demo/p60-263.html

Freitas, C. D., Jordan, H., & Hughes, E. K. (2018). Body image diversity in the media: A content analysis of women's fashion magazines. Health Promotion Journal of Australia, 29(3), 251-256. doi:10.1002/hpja.21

Hays, R. D., Sherbourne, C. D., & Mazel, R. M. (1993). The RAND 36-item health survey 1.0. *Health Economics,2*(3), 217-227. doi:10.1002/hec.4730020305

Hogue, J. V., & Mills, J. S. (2019). The effects of active social media engagement with peers on body image in young women. *Body Image,28*, 1-5. doi:10.1016/j.bodyim.2018.11.002

Kamimura, A., Christensen, N., Al-Obaydi, S., Solis, S. P., Ashby, J., Greenwood, J. L., & Reel, J. J. (2014). The relationship between body esteem, exercise motivations, depression, and social support among female free clinic patients. *Women's Health Issues,24*(6), 656-662. doi:10.1016/j.whi.2014.05.007

Korn, L., Gonen, E., Shaked, Y., & Golan, M. (2013). Health perceptions, self and body image, physical activity and nutrition among undergraduate students in Israel. *PLOS ONE,8*(3). doi:10.1371/journal.pone.0058543

Lim, L., Seubsman, S., & Sleigh, A. (2008). Thai SF-36 health survey: Tests of data quality, scaling assumptions, reliability and validity in healthy men and women. *Health and Quality of Life Outcomes,6*(1), 52. doi:10.1186/1477-7525-6-52

Markland, D., & Ingledew, D. K. (1997). The measurement of exercise motives: Factorial validity and invariance across gender of a revised Exercise Motivations Inventory. *British Journal of Health Psychology,2*(4), 361-376. doi:10.1111/j.2044-8287.1997.tb00549.x

Muyor, J. M. (2013). Exercise intensity and validity of the ratings of perceived exertion (Borg and OMNI Scales) in an Indoor Cycling Session. *Journal of Human Kinetics,39*(1), 93-101. doi:10.2478/hukin-2013-0072

Pearson, E. S., & Hall, C. R. (2013). Examining body image and its relationship to exercise motivation: An 18-week cardiovascular program for female initiates with overweight and obesity. *Baltic Journal of Health and Physical Activity,5*(2). doi:10.2478/bjha-2013-0012

Plonczynski, D. J. (2000). Measurement of motivation for exercise. Health Education Research, 15(6), 695-705. doi:10.1093/her/15.6.695

Silva, A. O., Diniz, P. R., Santos, M. E., Ritti-Dias, R. M., Farah, B. Q., Tassitano, R. M., … & Oliveira, L. M. (2018). Health self-perception and its association with physical activity and nutritional status in adolescents. *Jornal De Pediatria*. doi:10.1016/j.jped.2018.05.007

Stevens, S. D., Herbozo, S., Morrell, H. E., Schaefer, L. M., & Thompson, J. K. (2016). Adult and childhood weight influence body image and depression through weight stigmatization. *Journal of Health Psychology,22*(8), 1084-1093. doi:10.1177/1359105315624749

U.S. Census Bureau QuickFacts: University Park city, Texas; Texas. (n.d.). Retrieved from https://www.census.gov/quickfacts/fact/table/universityparkcitytexas,TX/PST045218

Yaman, H., & Atay, E. (2018). The effect of exercise prescription of primary care physician on the quality of life in patients. *London Journal of Primary Care, 10*(4), 93-98. doi:10.1080/17571472.2018.1464731

Table 1

Exercise Motivation Inventory

Category	Pre-Intervention	Ranking	Post-Intervention	Ranking
Body Related Motives:				
Appearance	3.625	8	3.910	7
Weight Management	4.428	2	4.464	2
Health Motives:				
Health Pressures	1.592	14	1.830	14
Ill-Health Avoidance	4.021	4	4.067	5
Positive Health	4.450	1	4.665	1
Interpersonal Motives:				
Affiliation	2.500	11	2.392	11
Competition	1.964	13	2.107	13
Social Recognition	2.214	12	2.285	12
Fitness Motives:				
Nimbleness	2.712	10	3.258	10
Strength/Endurance	4.125	3	4.303	3
Psychological Motives:				
Enjoyment	3.714	7	4.160	4
Challenge	2.946	9	3.267	9
Revitalization	3.782	5	4.043	6
Stress Management	3.750	6	3.821	8

[a]The Exercise Motivation Inventory is a 51-item survey assessing sources of motivation using a 6-point (0-5) Likert type scale.

Table 2

RAND SF-36 Survey

Category	Pre-Intervention	Post-Intervention	Sig	t
Physical Functioning	95.000	98.214	.108	-1.727
Role Limitations d/t physical health	94.642	100.00	.189	-1.385
Role Limitations d/t emotional problems	66.665	78.569	.292	-1.099
Energy/Fatigue	53.214	68.214	.002	-3.758
Emotional Wellbeing	68.571	77.714	.006	-3.309
Social Functioning	85.714	90.178	.315	-1.046
Pain	81.785	93.571	.032	-2.409
General Health	72.857	80.714	.015	-2.797
		df= 13	a=0.05	

[a]Data were compared using a paired t-test.