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A Causal Comparative Study of the Effects of Physical Activity Course Enrollment on College Students' Perceived Wellness, Mental Health, and Basic Psychological Needs

Genée' Regina Glascoe

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A CAUSAL COMPARATIVE STUDY OF THE EFFECTS OF PHYSICAL ACTIVITY
COURSE ENROLLMENT ON COLLEGE STUDENTS' PERCEIVED WELLNESS,
MENTAL HEALTH, AND BASIC PSYCHOLOGICAL NEEDS

by

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DEDICATION

This dissertation is dedicated to all the Black girls and women who has ever had a dream they thought was too big but still decided to dream BIG and go after it!

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First, I would like to acknowledge my chair, Dr. Ryan Carlson, and my committee members, Dr. Dodie Limberg, Dr. Jonathan Ohrt, and Dr. Collin Webster. There are not enough words to express how grateful I am for each of you. Since I stepped foot on USC's campus, you all challenged me to go above and beyond what I thought I was capable of. You never stopped believing in me, even when there were times, I had given up on myself.

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ABSTRACT

On college campuses, there has been an increase in mental health needs among students. In 2019, 56% of students attended counseling for mental health concerns compared to 46% of students who attended in 2010 (The Center for Collegiate Mental Health, 2019). Colleges have begun focusing on student wellness to assist their students with the capability to thrive during their college years and beyond (LaFountaine et al., 2006). Basic psychological needs must be met to achieve psychological growth and well-being (Ryan & Deci, 2000b; Zhang et al., 2012). Taliaferro et al. (2009) found evidence of an association between physical activity and reduced risk of hopelessness, depression, and suicidal behavior among college students. The purpose of this study was to assess whether college students currently enrolled in physical activity (PA) courses show better wellness and psychological distress, and basic psychological needs than students who have not taken the courses. This study uses a casual comparative survey design with a convenience sample of recruited undergraduate students (N=172). Half of the participants were enrolled in elective PA courses offered through the university's PA program. All participants will take the EUROHIS-QOL 8-item (EUROHIS-QOL; Schmidt et al., 2006), the Kessler Psychological Scale -10 (K10; Kessler et al., 2002), and Basic Psychological Need Satisfaction and Frustration Scale – In General (BPNSFS; Chen et al., 2015) to assess wellness, psychological distress, and basic psychological needs. Data were analyzed with descriptive statistics and multivariate analysis. The findings from this study will provide college health services professionals (e.g., counseling and wellness

centers' staff and faculty) with relevant information on the potential merits of PA programming as an intervention strategy for supporting students' mental health and wellbeing.

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CHAPTER 1

INTRODUCTION

Recently, there has been an increase in mental health symptoms among the college student population (Castillio & Schwartz, 2013; Prince 2015). College campuses' staff and administrators identified how to better assist students who are experiencing mental health symptoms and the impact these symptoms are having on students' overall wellness (Lipson et al., 2019; Lipson et al., 2018). Staff and administrators have begun to utilize workshops and events to assist students (Eisenberg et al., 2012). A potential method that could help students who may be experiencing mental health symptoms could be a physical activity (PA). PA is associated with extensive health benefits such as reducing mortality and preventing and treating common mental health disorders (Biddle, 2016; Peluso & Guerra de Andrade, 2005; Saxena et al., 2005).

There is existing evidence of the relationship between PA and mental health among college students (Van Kim & Nelson, 2013). Taliaferro et al. (2009) found evidence of an association between PA and reduced risk of hopelessness, depression, and suicidal behavior among college students. In contrast, more sedentary students tended to have increased stress, depression, and anxiety levels (Lee & Kim, 2019). Many college campuses offer credit-bearing PA courses that students can take either on an elective basis or to meet graduation requirements. However, there is a lack of evidence regarding the relationship between PA

courses and college students' wellness, psychological distress, and basic psychological needs. This study examined the differences in these outcomes for students who are enrolled in PA courses compared to students who have never taken a PA course in college. Understanding the potential role of PA courses in college students' wellness, psychological distress, and basic psychological needs may help introduce PA courses as a potential strategy to assist the growing number of students on college campuses dealing with mental health challenges.

Background of the Problem

The Center for Collegiate Mental Health's (2019) annual report showed an increase in college students attending counseling for mental health concerns from 46% in 2010 to 56% in 2019. College students are experiencing and reporting higher stress levels, depression, and anxiety (Prince, 2015; Watkins et al., 2012). The students who experience these symptoms are at an increased risk of comorbidities such as physical illness, psychosocial impairment, suicide, and dropping out of college (Dunley & Papadopoulos, 2018; Kessler et al., 1995).

The increase in students experiencing mental health symptoms on college campuses has counseling centers' staff and administrators trying to cope with this growing need (Kitzrow 2003; Watkins et al., 2012). College counseling centers' staff and administrators seek to engage students in several traditional counseling methods (e.g., individual and group counseling) through workshops, events, telehealth, and other marketing campaigns (Eisenberg et al., 2012). Yet, staff sometimes feel overwhelmed and ill-prepared to handle students' mental health concerns and the related demand for services (Watkins et al., 2012). Staff may experience burnout, a decreased focus on students with less severe concerns, and the need to end cases prematurely (Gallagher &

Taylor 2008; Watkins et al., 2012). Students may experience longer wait times or not receive counseling services, which can be problematic for college students who need help, especially those who may be early in their symptom development. Students who do not receive counseling services can experience impairment in their educational studies and social settings. Early identification and treatment of mental health symptoms could positively impact the trajectory of the symptoms and diagnosis (Pedrelli et al., 2015). Identifying preventive strategies for students could thus be beneficial for both students and staff.

One factor that can help to prevent or reduce the prevalence of mental health issues is physical activity (PA). Extensive health benefits, such as reducing mortality, have been associated with PA (Stanton et al., 2014). The biological and psychological benefits of exercise on cognitive functioning and well-being were valuable in helping academic achievement (Mandolesi et al., 2018). Even low amounts of leisure-time physical activity had the potential of adding years to one's life (United States Department of Health and Human Services [USDHHS], 2018a). When individuals who have been diagnosed with disorders such as depression, anxiety, and stress engage in PA, their symptoms improve (Ensari et al., 2015; Paluska & Schwenk, 2000; Teychenne et al., 2020). The benefits that PA conveys on mental health and perceived energy may be more immediate and dramatic to patients than its effects on physical health (Fontaine, 2000). Overall, PA can be an alternative to medication and used as an intervention that may be helpful for the promotion of mental health and well-being and the prevention and treatment of common mental health disorders (Biddle, 2016; Peluso & Guerra de Andrade, 2005; Saxena et al., 2005).

An existing resource for PA promotion on many college campuses is a PA program. PA programs typically consist of a wide range of credit-bearing PA courses for students to take on an elective basis or for graduation requirements. The purpose of such courses is to help students gain the skills and knowledge to be physically active throughout their lives (Leenders et al., 2003). PA courses can be a supplemental strategy to assist college campuses with their mental health service needs. The literature has shown that PA programs utilized as an alternative form of therapy were beneficial in reducing stress in college students (Leenders et al., 2003; Milligan, 2006). Also, college students who enrolled in PA courses were more likely to implement healthy behaviors that included less alcohol consumption, not smoking cigarettes, and eating more fruits and vegetables (Leenders et al., 2003). In addition, PA courses may be the only introduction that college students have to health, wellness, and PA in general (Adams et al., 2006). Kim and Cardinal (2017) found that university students who enrolled in physical activity courses, regardless of institution course policies (i.e., required vs. elective) mainly did so to improve their fitness levels and to obtain regular exercise followed by having fun, learning a new activity, and reducing their stress level.

Wellness is a multidimensional and holistic approach that helps people become their optimal selves (Goss et al., 2010). According to Hettler's (1980) Domains of Wellness, six dimensions are interrelated together. The dimensions are social, spiritual, physical, intellectual, emotional, and occupational. When an individual chooses to make changes in one dimension, the other dimensions of wellness are also affected (Myers & Sweeney, 2005). Barwais and colleagues (2013) identified that individuals involved in PA improved their physical and psychological dimensions of wellness.

Meanwhile, college students who spent time participating in activities related to

the different dimensions had better academic results than students who did not (Horton & Snyder, 2009). Colleges have focused on student wellness to assist their students with the capability to thrive not only during their college years but beyond (LaFountaine et al., 2006). Colleges encouraging students to enroll in PA courses may positively impact their student's overall wellness.

Basic psychological needs are a mini theory under the self-determination theory (SDT), comprised of the needs of autonomy, competence, and relatedness necessary to achieve psychological growth and well-being (Deci & Ryan, 2000b; Zhang et al., 2012). According to Ryan and Deci (2000b), anxiety, grief, hostility, and other negative emotions occur when psychological needs were not met. Basic psychological needs theory is applicable in addressing student wellness, psychological distress, and physical activity engagement among students (O'Shea et al., 2021; Sweet et al., 2012; Teixeira et al., 2018).

Statement of the Problem

College students need more support for their mental health symptoms and overall wellness (Baldwin et al., 2017; Oswalt et al., 2020). Students' mental health and overall wellness were positively impacted by PA. However, little research focused on the relationship between PA courses and college students' psychological distress, over all wellness, and basic psychological needs satisfaction.

Social Significance

Students arrive on college campuses with different needs, expectations, and concerns (Cornish et al., 2017). Students must deal with pressures such as staying in college, parental influences, and financial issues that negatively affect

their overall well-being (LaFollette, 2009). The number of students arriving on campuses with mental health symptoms and concerns that have not been diagnosed or adequately treated has increased. Dealing with these concerns can impact students' college success and overall health, impacting student retention (Dunley & Papadopoulos, 2018). It is important for college health service providers to understand how PA may be used to prevent, mitigate, and treat college students' mental health and overall wellbeing. Student health services experience less strain to fulfill students' needs when students are healthier (Petruzzello & Box, 2020). The information from this study would potentially contribute to creating resources, programming, toolkits, and further research for college counseling and wellness centers to address students' needs with PA and mental health. Overall, this study adds to the literature on physical activity courses and college students' basic psychological needs, wellness, and mental health.

Professional Significance

In counselor education, there is limited research addressing PA as a prevention or intervention strategy for counselors, counselors-in-training, and counselor educators to use in their professional work. Addressing PA is essential in the field of counselor education because of the emphasis on holistic care. Holistic care refers to the idea of treating the whole person instead of sum parts (Sweeney & Witmer, 1991). The results from this study may inform practitioners and training staff within the mental health field on the importance of PA programming to support clients' overall wellness and quality of life. Mental health providers have expressed difficulty addressing the topic of PA with their clients (deJonge et al., 2020). deJonge et al. (2020) found that college students were willing to participate in PA. However, mental health clinicians needed more resources and support to help facilitate the discussion about PA with their students. The students in

their study expressed wanting informational support from mental health professionals regarding the benefits of PA for mental health and available PA ideas. This study will help inform counselors and counselors-in-training about the benefits of college students participating in PA courses. While possibly identifying a resource for counselors to provide their students.

Counselors and counselors in-training need the proper training to explain the benefits of PA on mental health and wellness to college students. Counselor educators may use the information from this study to develop training and curriculum that counselors and counselors-in-training can use to address this topic. In the literature, helping professionals (e.g., counselors, psychologists, nurses) have expressed the lack of or no training they have received to address talking with their clients about PA and the relationship between mental health and wellness (Burton et al., 2010; Okonski, 2003; Pasquariello, 2011; Stanton et al., 2014; Way et al., 2018). Providing counselors-in-training with the data could contribute to developing a curriculum and training that will allow them to understand the topic while gaining information to assist their clients. Counselors, counselors in-training, and counselor educators can learn about the use of PA, particularly PA courses on college students' wellness and psychological distress.

Theoretical Foundation

The current study was founded on Self-Determination Theory (SDT) (Deci & Ryan, 1985; Deci & Ryan, 2000). SDT is a theory about motivation focusing on individual and social factors influencing people to reach growth and well-being. According to SDT, people are motivated to engage in activities leading to growth and well-being to meet their basic psychological needs of

competence, autonomy, and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2002; Zhang & Solmon, 2013). Additionally, physical activity courses have provided a sense of inclusion, integration, trust, and respect, supporting students' basic psychological needs and overall wellness (Fortier et al., 2012; Sánchez-Oliva et al., 2020). Through its perspective on essential psychological needs satisfaction, SDT can help explain PA's positive effects on college students' overall wellness and psychological health.

Study Aims

This study aimed to examine the influence of PA courses on college students' overall wellness, psychological distress symptoms, and basic psychological needs.

Research Questions/Hypothesis

I tested the following questions with the statement of hypothesis related to each question:

1. Do college students enrolled in university-based PA courses report higher levels of basic psychological needs satisfaction compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report higher levels of basic psychological needs compared to students who have never taken a university-based PA course.

2. Do college students enrolled in university-based PA courses report higher levels of wellness compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report higher levels of wellness compared to students who have never taken a university-based PA course.

3. Do college students enrolled in university-based PA courses report lower levels of psychological distress compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report lower levels of psychological distress compared to students who have never taken a university-based PA course.

Methodology

Research Design

This study included a casual-comparative survey design. Quantitative research includes collecting numerical data to explain a phenomenon (Muijs, 2004). A casual-comparative design does not involve manipulating one or more independent variables, and participants are not randomly assigned to conditions like in actual experimental designs. The causal-comparative design attempts to identify a cause-effect relationship between independent and dependent variables after an action or event has already occurred (Salkind, 2010). The design takes place in naturally occurring settings that require fewer resources and allow for the exploration of real-world effectiveness (Schweizer et al., 2016).

I also incorporated a cross-sectional survey design to quantify variables (i.e., basic psychological satisfaction needs, wellness, and psychological distress) in this study. A cross-sectional survey design is a type of quantitative descriptive design. A quantitative descriptive design can help describe possible relationships among variables (Heppner et al., 2016). This design allows the researcher to gain a greater understanding of explaining a phenomenon. In addition, a survey

research design can enable the researcher to explore the relationship between two or more variables without manipulation (Heppner et al., 2016; Privitera & Ahlgrim-Dezell, 2018).

Participants

The target participants for this study were college students (e.g., undergraduates) attending a United States post-secondary institution. Graduate students are not included in this study because this population already earned their bachelor's degree was less likely to be enrolled in physical activity courses. The post-secondary institution had a physical activity or health-related fitness program that offered courses in the following categories: aquatics, dance and rhythm, fitness and conditioning, outdoor activities, and sports. Courses offered in these categories fall under the recommended moderate-intensity aerobic or vigorous-intensity exercise (Piercy et al., 2018). The chosen categories for the courses were classified under previous research (Kim & Cardinal, 2019). The physical activity or health-related fitness program offered course credit that individuals could take towards earning a degree. Eligible participants were placed into two groups: students currently enrolled in a physical activity course during the Fall 2022 academic year and students who have never taken a physical activity course.

Eligibility

All eligible participants in the study were at least 18 years old and enrolled at the selected post-secondary institution within the United States. The post-secondary institution had a physical activity or health-related fitness program where participants could earn course credit towards their bachelor's degree. Individuals who attended an institution that had a physical activity or health-related fitness program but did not provide them the ability to earn course credit are not eligible for this study. Individuals

who had to take physical activity courses for degree completion were not eligible to participate in the study. Students required to take physical activity or health-related fitness program courses may not feel satisfied with their basic psychological needs met due to the requirements of having to take the course for degree completion, which may skew the data. Students who choose physical activity courses as an elective tend to be more motivated than students required to take courses (Kim & Cardinal, 2017, 2019).

Eligible participants in the physical activity course group were currently enrolled in a physical activity course during their participation in the study. Previously enrolled students who have taken a physical activity course or currently enrolled students taking a course, not in one of the following categories: aquatics, dance and rhythm, fitness and conditioning, outdoor activities, and sports, were ineligible to participate in the study. These students may or may not benefit from the effects of the previous course. These students may also experience a carryover effect from their last participation in the physical activity courses. Not including these students in this study will help control the potential threat to external validity due to history, treatment, and extraneous variables. Students enrolled in more than one physical activity course simultaneously were not eligible to participate. Enrollment in more than one physical activity course may skew the data because participants may appear more motivated by taking more than one class at a time. Participants diagnosed with a mental health disorder and those experiencing symptoms related to psychological distress were not excluded from eligibility to participate.

Sample Size

I conducted an *a priori* power analysis using G*Power 3.1 (Faul et al., 2009) to determine the sample size and adequate power. For the *a priori* analysis, the parameters chosen were an alpha level of .05, a medium effect size of .06 (Cohen, 1992), and a recommended power of .80 (Cohen, 1992). The *a priori* analysis provided a minimum sample of 180 college students to achieve adequate power to detect medium effects. However, the final sample included 172 participants. The group of students in the physical activity courses included 90 participants, and the group of students who never enrolled in physical activity courses was 82. My goal was to recruit at least 290 participants (145 per group) to avoid Type II error, account for participants dropping out of the study, and have a possible low response rate.

Description of Sampling Method

The study aimed to examine the impact of physical activity course participation on wellness, psychological distress, and the basic psychological needs of college students. Testing the whole population of college students would require a lot of time and resources. Unfortunately, due to the time-sensitivity of the study, testing the entire population of college students was not feasible. A convenience sampling method was the best to use since the groups of students were not randomly assigned. Farrokhi and Mahmoudi-Hamidabad (2012) mentioned that researchers in psychology and social sciences could only sometimes satisfy the requirement of randomizing with studies mainly dealing with human subjects. Convenience sampling is a type of nonrandom sampling where participants from the target population are selected by meeting specific criteria based on accessibility and/or proximity to the research (Dörnyei, 2007). Convenience sampling is also known for being inexpensive and feasible (Etikan et al.,

2016). Operating this sampling method allowed participants who met eligibility criteria to participate in the study, improving the ability to recruit the required sample size.

Instruments

Participants completed all instruments online using Qualtrics. The data collected was exported to SPSS for analysis.

Demographic Questionnaire. I provided participants with a demographic questionnaire to describe the participant sample (see Appendix D). The demographic questionnaire included questions asking participants to identify their current class standing (e.g., freshmen, sophomore, etc.), age, gender, college/school major, racial-ethnic identity, whether they were currently enrolled in a physical activity course, and if so, which category (e.g., aquatics, dance and rhythm, fitness and conditioning, outdoor activities, and sports).

Kessler Psychological Distress (K10). The K10, a 10-item self-report questionnaire (see Appendix E), was developed by Kessler et al. (2002) to measure the level of distress and severity associated with psychological symptoms over the past four weeks. The questionnaire uses a 5-point Likert response scale that ranges from 1, "*None of the time,*" to 5, "*All of the time.*" Scores range from 10-50 and are categorized into three levels: low (10-15), moderate (16-21), and high (22-50). The Cronbach's alpha for the K10 was 0.93 in the telephone pilot survey and 0.92 in the National Survey of Mental Health and Wellbeing. The K10 had good precision in the 90th-99th percentile range of the population distribution (standard errors of standardized scores in the range of 0.20-0.25) and consistent psychometric properties across major sociodemographic subsamples.

Additionally, the scales strongly discriminate between community cases and non-cases of DSM-IV/SCID disorders. The purpose of using the K10 was to assess psychological distress among participants.

EUROHIS-QOL. Schmidt et al. (2006) developed the EUROHIS-QOL 8-item index (see Appendix B) as an adaptation of the World Health Organization Quality of Life 100-item (WHOQOL-100) and the World Health Organization Quality of Life – (WHOQOL-BREF) to measure an individual’s perception of their health and well-being. An eight-item, self-administered questionnaire scored on a five-point Likert scale from 1, “Not at all,” to 5, “Completely.” The domains represented are physical, social, psychological, and environmental, with two questions devoted to each dimension. The score ranges from 8 to 40. A higher score indicates a greater quality of life. The total internal consistency scale was .80 in the United States (Rocha et al., 2012). Discriminant validity was conducted between depressed and nondepressed patients (CES-D score ≥ 16 and positive CIDI for major depression)—*Diagnostic and Statistical Manual of Mental Disorders*, (4th ed.) criteria. The EUROHIS-QOL 8-item was significantly discriminated from the collected sample. Meanwhile, Rocha et al. (2012) assessed for convergent validity of the EUROHIS-QOL 8-item with different mental health, physical health, and Quality of Life measures. All measures were found to be significant ($P < 0.001$). EUROHIS-QOL 8-item had the strongest correlation with the WHOQOL-BERF domains, physical = 0.73, psychological = 0.77, social = 0.61, and environment 0=.72. The purpose of using the EUROHIS-QOL was to assess the wellness of participants.

Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS). The BPNSFS (Chen et al., 2015) is a self-report questionnaire (see Appendix C) that measures whether basic psychological needs for autonomy, competence, and relatedness

are satisfied or frustrated, which must be met to have basic psychological need satisfaction according to the Self-Determination Theory (Ryan & Deci, 2017). The BPNSFS is a 24-item scale with six dimensions (autonomy satisfaction, autonomy frustration, relatedness satisfaction, relatedness frustration, competence satisfaction, competence frustration) containing a five-point Likert response ranging from 1, “*completely untrue*,” to 5, “*completely true*.” Each question corresponds to one of the dimensions. The scoring consists of the total scores for questions regarding that dimension. Items worded negatively (the frustration scales) will be reversed, scored, and averaged on the relevant subscale. A high total score indicates a high level of need satisfaction.

The explanatory factor analysis (EFA) confirmed the six factors. According to Chen et al. (2015), internal consistency ranged from .64 to .89 for each of the tested countries (China, Belgium, Peru, and the United States). The internal consistency for each BPNSFS English version subscale was .83 for relatedness satisfaction, .88 for competence satisfaction, .81 for autonomy satisfaction, .81 for relatedness frustration, .86 for competence frustration, and .71 for autonomy frustration. Furthermore, the BPNSFS was validated in other languages, including German, Portuguese, and Chinese. The purpose of using the BPNSFS was to assess basic psychological needs satisfaction among the participants.

Data Analysis

The independent variable for this study was whether participants are currently enrolled in a physical activity course or not and measured by the demographic questionnaire (see Appendix D). I created a dummy code variable

(0, 1) assigned to participant groups, indicating which group has participated in physical activity courses and those who have not. The dependent variables are participant's wellness (EUROHIS-QOL 8-item), psychological distress (K10), and basic psychological needs satisfaction (BPNSFS) scores.

Preliminary Analysis

Before analyzing data based on my research questions, I conducted a preliminary analysis of the data to check assumptions for normality, the presence of outliers, normality, linearity, homoscedasticity, and multicollinearity of variables. The preliminary analysis also tested for correlations in the demographic data to test for covariates. In addition, I completed descriptive statistics to describe the characteristics of the sample.

Assumptions. According to Pallant (2020), the following assumptions need to be made before testing the analysis in this study:

1. Sample Size: There need to be more cases in each cell than you have dependent variables. A larger sample will help with getting away with violations of some of the other assumptions.
2. Normality: The distribution of scores on the dependent variable should be normal.
3. Outliers: I need to check for Univariate and Multivariate outliers. Some cases may need to be deleted if there are too many outliers or extreme scores, or the variable involved needs to be transformed.
4. Linearity: There needs to be a straight-line relationship between each pair of the dependent variables.
5. Homogeneity of regression: This assumption is essential for performing a step-down analysis.
6. Multicollinearity and Singularity: MANOVA will work best when the dependent

variables are moderately correlated. Low correlations may cause the need to run a separate univariate analysis of variance for various dependent variables. Multicollinearity is when the dependent variables are highly correlated. Singularity is when one of the variables is a combination of other variables. It can be avoided by knowing the variables and how the scores are obtained.

7. Homogeneity of variance-covariance matrices: Multiple groups may have the same covariance matrix.

Primary Analysis

To determine statistically significant differences between participants who have taken physical activity courses versus participants who have not, concerning their scores on overall wellness, psychological distress, and basic psychological needs, I used multivariate analysis of variance (MANOVA). A MANOVA helps protect against a Type I error due to conducting multiple ANOVAs. If the preliminary analysis identifies correlations and covariates from the demographic data, analysis of covariance (MANCOVA) will be used to control for the covariates. Chartier and Allaire (2007) stated that when multiple univariate tests are used, estimation of the type I error inflation is difficult since the multiple tests are not independents. They also said that while univariate tests ignore the correlations among the variables, multivariate tests tend to be more potent than multiple univariate tests. The Statistical Package for Social Sciences (SPSS), version 29.0, was utilized for all data analyses.

Definition of Terms

This section addresses the theoretical and operational definitions of the key terms used in this study. The terms are defined as follows:

College Student- is currently enrolled in a two-year or four-year college or university.

Physical Activity Courses- represent various basic instructional skill or fitness orientated classes in aquatics, dance and rhythms, fitness and conditioning, outdoor activities, and sports.

Psychological distress- the state of unpleasant emotions or feelings affecting an individual's functional level, reflected in depression, anxiety, and stress (Henry & Crawford, 2005).

Basic Psychological Needs- autonomy, competence, and relatedness need to be met to account for various phenomena across developmental periods, cultures, and personality differences (Deci and Ryan, 2000).

Wellness- is a multidimensional and holistic approach, encompassing lifestyle, mental and spiritual well-being that is a conscious, self-directed, and evolving process of achieving full potential aligned with a set of values and aspirations (Goss et al., 2010).

Limitations

For this study, participants were not randomized, and results from this study could not be generalizable to all university students. Using a cross-sectional design is not a definite cause-effect result. In particular, this design has no control over the variables, so the variables are not manipulated in this study. Therefore, there is uncertainty about whether the independent variable caused changes in the dependent variables.

Participants' self-reporting is a limitation of internal and external validity threats. Some contributing factors may affect their self-report accuracy, such as the physical environment, their understanding of the instructions to complete the survey, and even how they feel emotionally or physically when taking the survey. Additionally, the chosen population would be considered a limitation. Finally, choosing a sample of convenience

is an issue because it does not give a range of data to test assumptions or reduce the chance of biases.

Summary

As college students' mental health symptoms continue to increase and impact their college experience, many are trying to identify preventive measures to address this issue. College campuses have begun to emphasize utilizing their counseling and wellness centers for students, faculty, and staff. With the increase in these services, there is a need to examine the effectiveness of these programs and services for future planning, implementation, and outcomes evaluation. This research seeks to add to the body of knowledge by testing whether physical activity courses relate to college students' overall wellness and psychological distress. Chapter two reviews the research and literature relevant to the present study. Chapter three describes the research design, methods, and statistical analysis used to conduct the present study. Chapter four summarizes the study's findings by describing how the results are related to the research questions and proposed hypotheses. Chapter five discusses the relevance of this study's findings to future research in physical activity, wellness, and mental health

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to examine literature as it relates to college student's mental health and physical activity courses. The theoretical framework for the study evolves from the Self-Determination Theory. Self-determination theory helps build a foundation for why students who engage in physical activity courses may exhibit fewer mental health symptoms. Therefore, following areas organize this chapter: (a) College Student Mental Health, (b) Physical Activity, (c) Physical Activity Courses, (d) Wellness, and (e) Self-Determination Theory.

College Student Mental Health

Most college students are between the ages of 18-24 (National Center for Educational Statistics, 2020). The 2019 National Survey on Drug Use and Health (NSDUH) methodological report by the Substance Abuse and Mental Health Services Administration (SAMHSA, 2020) reported that young adults aged 18-25 had the highest prevalence of any mental illness at 29.4% and serious mental illness at 8.8%. While adults aged 26 to 49 identified any mental illness at 25.0%, serious mental illness at 6.8%, and adults aged 50 and older, with any mental illness at 14.1% and serious mental illness at 2.9%. In a preliminary study of the World Health Organization (WHO) World Mental Health International College Student project (Auerbach et al., 2018) conducted

across eight countries, 35% of first-year students reported having at least one of the lifetime mental disorders assessed (i.e., major depressive disorder, mania/hypomania generalized anxiety disorder, panic disorder, alcohol abuse or dependence, and drug abuse or dependence). Transitioning to college can be an exciting time in a student's life. However, there can also be potential stressors and challenges in attending college. These stressors may include academic demands, family separation, social obligations, and work responsibilities (Bray & Born, 2004; Pedrelli et al., 2015). In the students' ability to handle all the challenges and stressors they may face; mental health symptoms and impairment of overall wellness may be affected.

Student mental health has become a growing concern on college campuses (Castillo & Schwartz, 2013). The Center for Collegiate Mental Health's 2020 annual report (CCMH, 2020), shows an upward trend over the last ten years, especially for depression, generalized anxiety, and social anxiety seen on the Counseling Center Assessment of Psychological Symptoms (CCAPS). The subscale scores for depression, generalized anxiety, and social anxiety increased between the lowest and highest scores over the last ten years on the CCAPS-62 item assessment. This information aligns with other studies that have seen more students experiencing and reporting higher distress, depression, and anxiety levels over the years (Prince, 2015; Watkins et al., 2012). Students who experience symptoms may have to deal with difficulty concentrating, emotional dysregulation, insomnia, elevated stress, and poor academic performance (Goodman, 2017). The effects of the COVID-19 pandemic have only exacerbated this population's known mental health and health risk factors (Lederer et al.,

2021; Liu et al., 2020).

The increase in students experiencing mental health symptoms on college campuses has administrators and counseling centers dealing with the growing demands of services (Kitzrow, 2003; Watkins et al., 2012). In examining mental health service utilization, Lipson and colleagues (2018) reported that between 2007 and 2017, treatment for services increased from 19% to 34%. More than 10% of the overall student population in their review sought assistance from campus counseling. Even though there is a growing number of students seeking treatment, many students are not engaging in treatment services due to limited time or the stigmatization of receiving counseling (Pedrelli et al., 2015). Universities and counseling centers are engaging students not only with traditional counseling methods (e.g., individual and group counseling) but through workshops, events, and other marketing campaigns (Eisenberg et al., 2012; Prince, 2015) to help with this growing need. Kazdin and Rabbitt (2013) identified different delivery models of services, besides the current traditional delivery, that could be useful in providing services to individuals who may not be able to access services. One model identified was lifestyle change or therapeutic change. This model introduces interventions that can assist in modifying high-risk behaviors that can or do positively affect health. The lifestyle change model has been most frequently used with exercise and nutrition as applied to physical health.

Baldwin et al. (2017) examined wellness factors among undergraduates who attended a research university or a small liberal arts college. This study focused on the multidimensional (physical, emotional, social, occupational, and intellectual) holistic wellness approach established by Hettler (1984). In examining the student's wellness, the authors hoped to identify factors that assist student success and retention. Unfortunately,

the authors did not include the spiritual wellness dimension in the analyses due to poor psychometric properties. Baldwin et al. (2017) learned that participants who attended the small liberal arts college reported higher physical activity levels and endorsed more health-related behaviors than college students attending the research university. Employed students reported greater self-efficacy and belongingness but less physical activity than those who were unemployed. The best predictor for physical well-being was self-esteem, and perceived stress was the best predictor of social well-being. Their study provided insight into college students' wellness and the differences among the type of universities. However, more literature is needed to examine the relationship between holistic wellness and college students, especially related interventions such as a physical activity course.

Physical Activity

Caspersen et al. (1985) defined physical activity as “any bodily movement produced by skeletal muscles that result in energy expenditure” (p.126). They asserted that people perform physical activity to sustain life and that the amount of physical activity a person does is a personal choice. Physical activity can be divided into light (leisure-time), moderate, or vigorous intensity. Physical activity can be considered anything, including household chores, sports, and conditioning exercises. In the literature, exercise and physical activity are used interchangeably, and sometimes it can be challenging to distinguish the two constructs apart due to the overlap. However, Caspersen et al. (1985) did not believe that exercise was synonymous with physical activity. The authors defined exercise as a “physical activity that is planned, structured, repetitive, and

purposive in the sense that improvement or maintenance of one or more components of physical fitness is an objective.” Knowing the difference between physical activity and exercise is essential for the current study. By definition, physical activity courses are considered exercise since it is activities that students would have engaged in and plan to participate in at least once per week during the course.

Benefits of Physical Activity

The biological and physical benefits of adults who engage in physical activity are likely to improve cardiovascular and metabolic health, introduce better weight maintenance strategies, reduce the risk of bone fracture, better bone mass and mineral density, increase muscular mass, strength, and power (Mandolesi et al., 2018). The biological and physical benefits also include reduced risks of breast and colon cancer, high blood pressure, coronary heart disease, stroke, hypertension, improved brain, cognitive functioning, and well-being (Roychowdhury, 2020). In their review of the effects of physical exercise on cognitive functioning and well-being, examining the physical and psychological benefits, Mandolesi et al. (2018) identified that physical exercise has been beneficial in helping with academic achievement. Physical activity also reduces mortality (Moore et al., 2012). In Moore et al. (2012), study participants engaged in physical activities that are not required as daily living activities and performed at the person’s pleasure (USDHHS, 2018a), also known as leisure-time physical activity, per week had longer life expectancies. Even low amounts of leisure-time physical activity, 75 mins of walking per week, had the potential of adding years to one’s life.

Physical activity can be an alternative to medication and intervention that may be helpful for the promotion of mental health and well-being, the prevention and treatment of common mental health disorders, and as a strategy in psychosocial rehabilitation,

especially for individuals with severe mental health disorders (Biddle, 2016; Peluso & Guerra de Andrade, 2005; Saxena et al., 2005). Moreover, physical activity may help prevent the damaging effects of age on psychological and physical health (Roychowdhury, 2020). Adults who can meet their daily needs are associated with higher physical activity levels (USDHHS, 2018b).

Overall, physical activity is beneficial in improving a person's health and well-being. Health professionals should inform people about these benefits and strongly encourage them to incorporate physical activity into their daily routines (deJonge et al., 2020; UDDHHS, 2018a). The type of physical activity performed is less critical than assisting individuals in finding an activity they can perform consistently. Any physical activity is better than no physical activity. Physical activity's benefits on mental health and perceived energy may be more immediate and dramatic to patients than its effects on physical health (Fontaine, 2000).

Even with the positive benefits of physical activity, some barriers have impacted people from engaging in it. These barriers include lack of time, too tiring, too weak, fear of failing, bad weather, no facilities, and lack of exercise partners (Troost et al., 2002). Kulavic et al. (2013) explored the physical activity barriers among traditional and nontraditional college students. The top three barriers among the participants were lack of time, energy, and willpower. For nontraditional students, the barriers were fear of injury, lack of skills, and lack of resources, which were higher than for traditional students. Understanding the literature on the benefits and barriers of physical activity is essential because it helps guide why it will benefit college students' wellness and mental health.

Type of Physical Activity

Aerobic and strength exercises are the two physical activity types positively improve mental health symptoms (Aylett et al., 2018; Lam & Riba, 2016). Lam and Riba (2016) identified aerobic exercises recognized for their mood-elevating effects and neurophysiological changes. Herring and colleagues (2011) explored the impact of a six-week resistance and aerobic exercise training program with thirty women. The participants were diagnosed with generalized anxiety disorder, and the only treatment that some participants engaged in was pharmacotherapy. The women were assigned to the resistance exercise training program, aerobic exercise training, or the waitlist.

In their findings, Herring et al. (2011) discovered that the women who engaged in the resistance exercise training program saw significantly reduced anxiety, tension, and the frequency and intensity of irritability. Conversely, women who participated in the aerobic exercise training program saw improvements in trait anxiety, concentration, irritability, muscle tension, fatigue symptoms, and vigor. However, this study did not examine the differences between resistance and the aerobic exercise training programs. Still, they saw a more significant effect in the resistance exercise training program versus the aerobic exercise training program in nine of the 12 outcome variables.

Another study explored using a 12-week aerobic exercise and stretching program on the psychological, cognitive, and physiological changes in individuals with clinical depression (Foley et al., 2008). This small pilot study ($n = 23$) resulted in significant decreases in the severity of depression and increases in coping efficacy and episodic memory over 12 weeks with both aerobic exercise and stretching programs. Despite positive psychological and cognitive changes among both programs, this study had a high drop-out rate ($n = 10$ overall) among participants, particularly the stretching group ($n = 8$ withdrawn). Unlike the Herring et al. (2011) study, this study did not include a

comparison group.

Level, intensity, type, and amount of physical activity involvement may have different beneficial effects for males and females (Roychowdhury, 2020). Males tend to have higher physical activity levels and participate in vigorous-intensity physical activity, while females are likelier to engage in low to moderate-intensity physical activity (Agans et al., 2020; Roychowdhury, 2020). Understanding the different physical activity types is relatable to the current study because it helps demonstrate the kind of physical activity that may significantly affect participants. There needs to be more literature exploring the different physical activity types, particularly physical activity courses, and their relationship with mental health.

Mental Health and Physical Activity

Extensive literature explored the benefits of physical health on mental health (Mammen & Faulkner, 2013; Paluska & Schwenk, 2000). Depression, anxiety, and stress are commonly examined in the literature on physical activity and exercise (Dogra et al., 2018; Paluska & Schwenk, 2000; Pascoe et al., 2020; Stults-Kolehmainen & Sinha, 2014; White et al., 2020). Unfortunately, individuals diagnosed with depression and anxiety are less physically active than those without a diagnosis (Martinsen, 2008).

When individuals diagnosed with depression, anxiety, and stress engage in physical activity, their symptoms improve (Ensari et al., 2015; Paluska & Schwenk, 2000; Teychenne et al., 2020). Stubbs et al. (2017) conducted a meta-analysis that included six randomized control studies investigating the benefits of exercise in people with anxiety and/or stress-related disorders. They found a

moderate effect size of $d = 0.58$, indicating that exercise can be valuable in treating people with anxiety/stress disorders. These findings were similar to a study done by Conn (2010), who explored the benefits of supervised and unsupervised physical activity interventions on healthy adults' depressive symptoms. A moderate effect size of $d = 0.372$ was identified among supervised physical activity studies and $d = 0.522$ among unsupervised physical activity studies. The results showed physical activity interventions as beneficial for reducing depressive symptoms even in adults without a clinical diagnosis. Paluska and Schwenk (2000) found that aerobic and nonaerobic PAs seemed helpful in treating mild-to-moderate depressive symptoms. In a nationally represented sample of non-depressed African Americans, increased leisure-time physical activity levels were associated with fewer depressive symptoms (Torres et al., 2013). Dunn and colleagues (2005) explored the amount of exercise and the reduction of depressive symptoms in patients with major depression who exercised individually. According to the public health recommendation, individuals who exercised three to five times per week had more significant reductions in depression than those who exercised at a low intensity.

Teychenne et al. (2008) completed a systematic review exploring the effects of physical activity on the likelihood of depression in adults. They examined studies that investigated at least one association between physical activity dose (i.e., frequency, intensity, and duration), domain (i.e., domestic, leisure-time, work-related, and transport-related physical activity), setting (i.e., home- or- center-based) and depression or symptoms of depression in adults. In their analysis, four observational studies found that vigorous-intensity physical activity was more strongly associated with a decreased likelihood of depression than lower intensities. Both moderate and vigorous intensities were as effective in reducing the possibility of depression.

They expressed limited research exploring the association between physical activity and the likelihood of depression with other activity domains such as work-related, transport-related, or domestic physical activity (Teychenne et al., 2008). Leisure-time physical activity may have a stronger association with reducing the risk of depression due to social interaction. Leisure-time physical activity often takes place in social environments, which can provide mutual support and social relationships. Their study included methodological limitations, such as small sample sizes, short follow-up in longitudinal studies, reliance on self-report measures of physical activity, and observational studies that cannot provide evidence of causality.

Exercise may be an effective treatment for people with various anxiety problems (Aylett et al., 2018). A meta-analysis completed by Aylett et al. (2018) included studies where participants did not formally diagnose an anxiety disorder. The review allowed for the comparison between study participants with a clinical diagnosis of anxiety and those without a diagnosis. This information applies to the current proposed study because participants may experience anxiety symptoms but will not have a formal diagnosis. Participation in a physical activity course for those with a formal diagnosis may lower anxiety symptoms than participants not engaged in a course.

In another review exploring the use of exercise and physical activity interventions in people with the following diagnosis: anxiety, affective, eating, substance use disorders, schizophrenia, and dementia/mild cognitive impairment, Zschucke et al. (2013) saw evidence suggesting that interventions used with these groups made improvements in physical, subjective, and disorder-specific clinical

outcomes.

Utilizing a regionally representative study, Sheikh et al. (2018) investigated the association between leisure time light and moderate-vigorous physical activity and psychological distress in adults over 13 years. This study adjusted for multiple potential confounders. The authors learned that light and moderate-vigorous physical activity protected against future psychological distress. Limitations included not having a measure of psychological distress at baseline and being unable to control or remove people with pre-existing psychological distress. Sheikh et al. (2018) also stated that individuals with psychological distress might have been discouraged from participating in physical activities, making reverse causation a concern.

The relationship between physical activity and mental health can be bi-directional. However, it is also essential to address how mental health can adversely affect one's ability to engage in physical activity. Just like a person may have trouble with their physical health and not want to engage in treatment and recovery, these effects can also be due to their mental health. A person may have trouble with their mental health, causing them not to engage in physical activity (Faulkner & Carless, 2006; Lando et al., 2006). Young adults with reported anxiety symptoms have shown a possible inverse relationship between their symptoms and physical activity (O'Loughlin et al., 2013). In predicting physical activity among people with a mental diagnosis, Zechner and Gill (2016) noticed that a person experiencing depressive symptoms might be less inclined to engage in physical activity. The more a person is depressed, the less likely they will exercise, which might exacerbate their depressive symptoms. Therefore, a person may become more depressed due to the lack of exercise, creating a continuous cycle, especially among individuals with serious mental health illnesses (Zechner & Gill,

2016).

Therefore, the literature regarding physical activity on mental health is relevant to the current study because I will investigate physical activity's relationship with students' mental health, mainly focusing on students' psychological distress. The construct used to assess students' psychological distress includes scales focusing on depression, anxiety, and stress.

Prevention of Mental Health

Physical activity has helped decrease mental health symptoms of anxiety (Aylett et al., 2018; Conn, 2010; Herring et al., 2011; Martinsen, 2008), depression (Dunn et al., 2005; Kvam et al., 2010; Lam & Riba, 2016; Martinsen et al., 1989), serious mental illness (Marzolini et al., 2008), and stress (Baghurst & Kelley, 2014; Stults-Kolehmainen & Sinha, 2014) but also useful in the prevention of mental health symptoms. Despite the frequency, intensity, and duration, engaging in physical activity is essential in reducing the risk of mental health symptoms (Mammen & Faulkner, 2013; Stanton et al., 2014). Mammen and Faulkner (2013) reviewed physical activity to prevent future depression. Twenty-five out of the thirty studies demonstrated that baseline physical activity was negatively associated with a risk of depression. The authors identified that sustaining physical activity levels over time can be beneficial in preventing further depression. Despite an individual's history of inactivity, participating in physical activity can help prevent depression (Mammen & Faulkner, 2013).

Stanton et al. (2014) suggested that physical activity could help prevent and reduce the risk of future depressive episodes. The authors suggested that moderate-intensity exercise and physical activity may be the preferred intensity

by those diagnosed with depression and lead to greater physical activity adherence. These individuals should know of the health benefits of completing repeated brief activity sessions. Stanton et al. (2014) stated that more studies on preventing depressive episodes should report the intensity and physical activity amount. Still, they also need to focus on reporting the activities these individuals should engage in.

O'Loughlin et al. (2013) completed a longitudinal study examining whether there is a relationship between different subtypes of anxiety disorders (e.g., panic disorder, social phobia, generalized anxiety disorder (GAD), & agoraphobia) and the frequency, intensity, or type of physical activity in young adults. In their study, 21-47% of participants reported anxiety symptoms. However, only 7% of participants were diagnosed with an anxiety disorder. They found that participants with GAD symptoms were less likely to meet physical activity guidelines, while those with agoraphobia symptoms were more likely to walk frequently. Participants who reported having GAD symptoms may experience low levels of physical activity or not engage in exercise at all due to the possibility of experiencing symptoms such as physical fatigue, unable to sleep, lack of mental energy, the fear of getting hurt, or even misinterpreting the biological response that they feel like a symptom instead of the benefits of the activity. O'Loughlin et al. (2013) suggested that people with GAD symptoms may need to re-interpret the physiological sensations associated with moderate-vigorous physical activity. They also indicated that physical activity interventions should promote active transportation, breaking the activity up into short sessions throughout the day, and having access to clean and safe facilities can be effective (O'Loughlin et al., 2013).

O'Loughlin et al. (2013) noticed that participants with agoraphobia choose to walk frequently. Walking more may be due to the opportunity to escape from crowded

places like fitness classes and public transportation. While walking at a moderate intensity level has been associated with health benefits and increasing physical activity levels in people with agoraphobic symptoms. The authors suggested that more research between agoraphobia and physical activity is needed. The results did not display symptoms of panic disorder and social phobia associated with physical activity (O'Loughlin et al., 2013). Knowing how young adults with specific anxiety disorders react to physical activity will help create physical activity interventions for this population. There is still more research needed in this area.

Information is still needed to explore the prevention of mental health symptoms, particularly with specific mental health diagnoses. The current study includes participants not formally diagnosed with a mental health diagnosis. The goal is to explore how physical activity courses relate to students' mental health and wellness. My study will help understand the need for students to participate in physical activity courses to benefit their mental health and overall wellness.

College Student Physical Activity and Mental Health

When students transition from high school to college, their physical activity levels decrease significantly within their first year of college (Bray & Born, 2004). Decreased physical activity could lead them to become inactive throughout their time in school. Bray and Born (2004) explored first-year students' reports of vigorous physical activity and psychological well-being during their first two months of university transition compared with the last two months of their senior year of high school. The authors represented psychological well-being as mood and psychological distress. The General Health

Questionnaire-28 (GHQ-28;) was used to construct psychological distress. In their findings, Bray and Born (2004) discovered that only 44% of the participants were active during their first two months of college compared to 66.2% of active participants during their last two months of high school. In their analysis of physical activity and psychological well-being, active participants reported more positive moods and higher vigor levels than insufficiently active ones. The authors suggested that further research is needed to explore how health promotion professionals can help students manage their health and active lifestyles as they navigate the transitions of college students.

A systematic review by Dogra et al. (2018) explored the potential associations of physical activity, sedentary time, and fitness with stress, depression, and anxiety in post-secondary students. They concluded none of the studies identified associations between physical activity and stress or assessed sedentary time or fitness associations with stress, depression, or anxiety amongst post-secondary students. However, Snedden et al. (2019) explored sports and physical activity on student-athletes and undergraduate students. They identified that when students are more active and engaged in sport and physical activity, they experience decreased symptoms of depression. In addition, Taliaferro et al. (2009) found evidence of an association between physical activity and reduced risk of hopelessness, depression, and suicidal behavior among college students. Conversely, more sedentary students tend to have increased stress, depression, and anxiety levels (Lee & Kim, 2019).

Tyson and colleagues (2010) examined the relationship between physical activity, anxiety, and depression in an undergraduate university population in the United Kingdom. In assessing anxiety and depression, the study used the Hospital Anxiety and Depression Scale (HADS). HADS has known to be suitable for populations who do not

have a clinically defined psychiatric disorder. The Physical Activity Questionnaire (PAQ) investigated the effects of physical activity and cardiovascular fitness on mental health and mood.

Findings showed that students who had high physical activity levels showed significantly lower levels of anxiety and depression than the medium and low physical activity groups (Tyson et al., 2010). When physical activity levels increased, self-reported anxiety and depression levels decreased. A dose-response relationship could be taken from this study, where the greater the physical activity, the lesser the symptoms of anxiety and depression. The current study found that 60% of students showed elevated levels in terms of anxiety. Regarding depression, only 10% of students showed elevated levels indicating that this problem is much less prevalent. In their findings, elevated anxiety levels among participants suggested that this may contribute to a lack of engagement in physical activity. The study was a cross-sectional design; therefore, the results cannot have cause-and-effect relationships.

Uddin and others (2020) used one-year prospective data to investigate the relationship between insufficient physical activity and sedentary behavior on university-based young adults' psychological distress in Bangladesh. This study was a cross-sectional design, using a non-random convenience sample of first, second-, and third-year students aging from 18-24 that attended six universities in Bangladesh. The Kessler Psychological Distress (K6) scale was used to measure psychological distress, and the Global Physical Activity Questionnaire (GPAQ) was used to measure physical activity and sedentary behavior. The data were analyzed using the Generalized Estimating Equations with the Gaussian family

and identity link under an exchangeable correlation structure. Through their analyses, researchers found that insufficient physical activity was associated with high psychological distress regardless of sedentary behavior (Uddin et al., 2020). The researchers also noticed that inadequate physical activity and high sedentary behavior increased psychological distress significantly more than sufficient physical activity and low sedentary behavior in the study participants. Insufficient physical activity and low sedentary behavior also significantly increased psychological distress, which they stated was consistent with low physical activity's expected adverse impact. However, they found no significant differences in distress between sufficient physical activity and high sedentary behavior and sufficient physical activity and low SB. Insufficient physical activity can considerably negatively affect university-based young adults' psychological health, regardless of SB (Uddin et al., 2020).

Uddin et al. (2020) used public and private university participants to gain a better heterogeneous sample. Despite the large sample, they recruited participants by attending different university classes and lectures. Their study did not actively recruit students who were currently enrolled in physical activity courses. The study differs from mine because I actively recruited students in other courses, but a heavy focus was on students in physical activity courses. Uddin et al. (2020) provided an international perspective by exploring the effects of physical activity and mental health on college students, which helps to understand how other college students worldwide can be affected by physical activity and mental health.

Demers (2013) also examined the relationship between a six-week exercise program and mental health in college students. Demers focused on physical fitness changes and the self-reports of anxiety and depression symptoms before and after

participating in the program. College students who participated in the exercise program reported improved mental health and maximal oxygen uptake scores compared to the control group, where there was only a significance in their maximal oxygen uptake scores. There was no significance in attitudes in the stages of change, body compositions, and Body Mass Index in both groups. Demers (2013) recommended that an exercise prescription could be used as a tool to alleviate symptoms of depression and anxiety in college students. Physical activity can promote positive mental health among college students. Exercise can be used as an additional tool in treatment plans for students who present mild symptoms of depression or anxiety or as a prevention tool for mental illness.

Exploring the effects of physical activity on mental health and well-being in college students, Herbert et al. (2020) completed a series of pilot studies examining university students' relationships in Germany. They also explored the potential health benefits of a short-term, aerobic exercise program in an online and laboratory study. Herbert et al. (2020) chose a within-in-subjects pre-post experimental intervention design with randomization for the aerobic exercise program. The sample included 106 participants, 74 participants in the online study, and 32 participants in the laboratory study. Only two men were in the laboratory study, so their data were excluded from the primary analyses. Participants were randomly assigned to one of the three groups (exercise intervention, expressive writing group for the online study, motor coordination for the laboratory study, and the waiting list control group). Participants of both studies received the same standardized self-report measures to assess for severity of depressive symptoms (Beck Depression Inventory (BDI-II)), trait and state

anxiety (State-Trait Anxiety Inventory (STAI)), positive and negative effects (Positive and Negative Affect Schedule (PANAS)), perceived stress and coping strategies (Stress and Coping Inventory (SCI)), quality of life (WHOQOL-BERF), regular physical activity (Global Physical Activity Questionnaire (GPAQ)), and body image (body dissatisfaction subscale of the Eating Disorder Inventory (EDI-2)). Participants were asked about their motivation to continue exercising or writing after completing the intervention. Only students without a clinical diagnosis of neurological, somatic, and psychiatric disorders were eligible to participate in the pilot studies' present series.

In their findings, Herbert et al. (2020) discovered that the sample of female university students reported lower levels of depression than the online sample. The validity of these findings may be limited to undergraduate and first-year students because 26 of the 30 female participants were first-year undergraduate students. All the students reported experiencing chronic stress due to uncertainty and excessive demands about perceived stress. Accordingly, the male and female participants of the online study who participated in regular physical activity were associated with lower levels of depression, anxiety, and psychosomatic stress and better quality of life across the following domains: physical health, well-being, and social relationships (Herbert et al., 2020).

In the aerobic exercise intervention findings, depressive symptoms among the female and male participants of the online study sample significantly decreased between times (Herbert et al., 2020). Among those assigned to the aerobic exercise intervention condition, 73.68% demonstrated improvements in depressive symptoms. Further, the exercise intervention resulted in significant improvements in perceived stress. However, the aerobic exercise intervention did not alleviate the psychosomatic symptoms of perceived stress, nor did it demonstrate significant changes in the quality of life than the

wait-list control and expressive writing intervention groups. Additionally, the post-test, participants' state anxiety scores were lower among those assigned to the exercise intervention group than those assigned to the other groups. With the laboratory study, the pilot studies revealed that six weeks compared to two weeks of regular engagement in low- to moderate-intensity aerobic exercise could significantly lessen depressive symptoms of healthy university students without a history of depression. The present findings underscore the need to implement exercise interventions in universities to promote mental health and well-being among university students in the short (i.e., during their academic program) and long term.

Mailey et al. (2010) conducted a randomized pilot trial examining the effects of an internet-based physical activity intervention on physical activity, self-efficacy, depression, and anxiety in 47 college students receiving mental health counseling. The trial took place over ten weeks, and regardless of the participants' assignments, they continued to receive counseling services. Students assigned to intervention wore a pedometer daily, completed an activity log, were given access to a specifically designed website for the project, and attended two monthly meetings with a physical activity counselor. The control group received mental health counseling, completed measures at pre- and post-trial, and was later given access to the website. Participants were assessed for physical activity, depression, anxiety, exercise self-efficacy, and barriers to self-efficacy at baseline and post-intervention.

Mailey et al. (2010) reported that students increased physical activity levels across the 10-week intervention but with a more significant increase in the

intervention with an effect size of ($d = 0.68$) than the control condition effect size ($d = 0.05$). Exercise and barriers self-efficacy declined across the intervention but more so in control than intervention condition. Effects on depression and anxiety were nonsignificant. There was a slight decrease in anxiety in the intervention ($d = -0.09$) but an increase in anxiety in the control group ($d = 0.27$). Depression, on the other hand, saw slight decreases in both the intervention ($d = -0.12$) and control conditions ($d = -0.07$). There was an increase in physical activity associated with an increase in exercise self-efficacy ($r = 0.62$) and barriers self-efficacy ($r = 0.63$) and decreases in depression ($r = -0.44$) in the intervention condition but not in the control condition. The study's small sample size and the need to identify why participants were attending counseling are some of the limitations of this study. However, this study can explore how an internet-delivered physical activity intervention may be a potential approach to promoting activity among college students undergoing mental health counseling (Mailey et al., 2010).

Another study investigated the effectiveness of a campus-based physical activity program for student mental health (deJonge et al., 2020). The authors utilized a mixed-method design to collaborate with an on-campus mental health service. Participants were recruited from the campus mental health center and were referred to the program. The intervention was a 6-week one-on-one and individualized physical activity program tailored towards students seeking mental health support. A pretest-posttest design was used to assess the program's effectiveness and the changes in psychological distress symptoms, depression, and anxiety. For the quantitative part of the study, the authors used the following measures: International Physical Activity Questionnaire-Short Form (IPAQ; Craig et al., 2003) and the Mental Health Inventory-38 (MHI-38; Veit & Ware, 1983). Furthermore, the authors used a paired samples t-test, an independent samples t-

test, and descriptive statistics. After completing the intervention, a semi-structured interview with 11 program participants was conducted to explore the program's acceptability and was analyzed using thematic analysis.

deJonge et al. (2020) had a 75% satisfactory completion rate by participants in their findings. Students who participated in the program discussed the program's effectiveness from a well-being and self-care perspective and shared the importance of physical activity in improving mental health symptoms. Participants in the study shared how they liked the one-on-one and individually tailored program. deJonge et al. (2020) suggested that this study's findings supported the consideration of physical activity as a low-intensity psychological intervention for students experiencing mild/moderate mental health concerns. This study is not without limitations, including participants who were already seeking mental health support, and the physical activity that participants participated in outside of the one-on-one sessions was not measured. The author did not identify whether the frequency, intensity, duration, or type of self-directed physical activity impacted further changes in physical activity. The study applies to the literature about physical activity programming for college students and mental health. Concerning my research, students did not receive one-on-one instruction like the deJonge et al. (2020) study participants. Students were not recruited or referred from the counseling center, therefore, targeting the population of those who are not receiving services.

Physical Activity Courses

Before the 1980s, over 80% of institutions in the United States required college students to take physical activity courses to graduate (Oxendine, 1969). In

2010, between about 38% - 58% of four-year (Cardinal et al., 2012; Strand et al., 2010) and about 18% of two-year (Strand et al., 2010) institutions required physical activity courses for graduation. The beginning physical activity courses were mainly activity-based, involving sports and lifetime activities (Adams & Brynteson, 1995). Over 87% of two-year and four-year institutions offer the courses (Strand et al., 2010), many as an elective, and allow college students to select from a sport or physical conditioning. The courses were held over multiple time frames throughout a semester (e.g., 4-15 weeks) (Annesi et al., 2017) and delivered face-to-face or online. Courses and curriculums today may also be a combination of lectures (on fitness and wellness concepts) and a physical activity/laboratory component and maybe titled HRF, “Lifetime Fitness,” “Fitness and Wellness,” or something similar (Strand et al., 2010). Physical activity courses can help college students overcome the various barriers they may face (National Association for Sport and Physical Education [NAPSE], 2007). Physical activity programs for college students have been around for over a century. The name of physical activity courses varies from institution to institution (Hensley, 2000). The variety of terms may include “basic instruction program” (BIP), “instructional physical activity courses” (IPAC), health-related fitness (HRF), “Lifetime Fitness,” “Fitness and Wellness,” and others (Annesi et al., 2017; Hensley, 2000; Strand et al., 2010).

Enrollment and Choice

Leenders et al. (2003) identified that about one in three students only engage in regular physical activity the course. In addition, they found that males are more likely to have higher physical activity levels outside of class than female students. Therefore, there is reason to believe that this population of students will practice healthier behaviors than the general undergraduate population because they are in a physical activity course

(Leenders et al., 2003).

Kim and Cardinal (2017) also explored why university students enrolled in physical activity education courses. However, they explored why students enrolled in physical activity courses at institutions with different course policy arrangements. They also examined whether those reasons were associated with students' motivation, competence, and physical activity behaviors. Kim and Cardinal (2017) recruited 519 participants from two public universities in the Pacific Northwest region of the United States. The difference between the two universities was that one required students to take a physical activity course to graduate, while the other did not. The authors used the following measures, a list of 17 possible reasons for enrolling in the physical activity courses (statements obtained from previous studies, Leenders et al., 2003; Steinhart & Dishman, 1989), the Behavioral Regulation in Exercise Questionnaire ([BREQ-2], Markland & Tobin, 2004), the Intrinsic Motivation Inventory (McAuley et al., 1989), and the Weekly Leisure Time Exercise Questionnaire ([WLTEQ], Godin & Shephard, 1985). Additionally, Kim and Cardinal (2017) used descriptive statistics, discriminant function analysis to determine whether the types of motivation, competence, and weekly exercise metabolic equivalent units (MET) to predict students' reasons for enrolling in physical activity courses, and a 3 x4 Chi-square analysis to understand the differences in types of physical activity courses in which students enrolled.

Similar to Leenders et al., 2003, they also found that university students who enrolled in physical activity courses, regardless of institution course policies (i.e., required vs. elective), mainly did so to improve their fitness levels and to

obtain regular exercise followed by having fun, learning a new activity, and reducing their stress level (Kim & Cardinal, 2017). They also explored the primary reasons female and male students enrolled in physical activity courses. Kim and Cardinal (2017) discovered that female students' amotivation, intrinsic motivation, and weekly exercise METs were significant predictors, whereas their intrinsic motivation was the only predictor for males. They also noticed that the reasons females enrolled in physical activity courses could be affected by the institution's physical activity course policy. Females who were taking the required course reported "having fun" and "learning a new skill" as their top reasons (i.e., intrinsic regulatory reasons). In contrast, those without a requirement reported: "improved fitness" and "exercise regularly" (i.e., extrinsic regulatory reasons). At the same time, male students' reasons for enrollment and motivation appeared to be stable regardless of an institution's physical activity course policy.

In exploring the types of physical activity courses in which students enrolled, fitness was the most frequent physical activity course for female and male students (Kim & Cardinal, 2017). The findings implied that outdoor activities attracted more upper-level students, whereas first-year students were likelier to enroll in team sports. The authors stated that students' enrollment patterns for some types of physical activity courses might differ depending on academic standing, and further exploration is needed in this area. Because this was a cross-sectional study, it is difficult to generalize the data to all universities and colleges with differing course policies. Nonetheless, findings from the study helped explain why college students enroll in physical activity courses, especially at institutions that do not require students to enroll in physical activity courses (Kim & Cardinal, 2017). Also, this study is beneficial in helping to understand students' self-

determined physical activity behavior.

In examining the differences among different types of health and wellness courses offered, Agans et al. (2020) assessed college students' physical activity behaviors and attitudes in five different types of self-selected required health and wellness courses (lifetime, general health and wellness, theory, mind-body, and fitness) during a semester. In their findings, they noticed demographic differences among the types of health and wellness courses. Older and male students were likely to enroll in lifetime and fitness courses. Younger and female students enrolled in general health and wellness courses, and female students with a higher average GPA enrolled in mind-body courses. The authors noticed no changes while observing all participants' physical activity behaviors and physical activity-related attitudes. However, they did see changes in physical activity behavior for students enrolled in fitness, mind-body, and general health and wellness courses. The courses did not significantly increase students' physical activity levels.

Tracy et al. (2017) also investigated the impact of choice in conceptually based college health and wellness course. They paid attention to the exercise motivation and physical activity of undergraduate students. This study's theoretical framework included the self-determination theory and adult learning theory to hypothesize that allowing adults to choose physical activities during fitness classes may improve exercise motivation and physical activity levels (Tracy et al., 2017). The Fitness for Life course utilized in this study is a required health and wellness course that includes a lecture and laboratory approach with a weekly physical activity component over 15 weeks. There were four sections of the course. Two sections allowed students to choose what physical activities they

participated in, and the other two sections participated in activities planned and implemented by the instructor. The study's measures were the Behavioral Regulation in Exercise Questionnaire ([BREQ-2], Markland & Tobin, 2004) and The Godin-Shephard Leisure-Time Physical Activity Questionnaire ([LTEQ], Godin, 2011). The study of Tracy et al. (2017) used a sequential explanatory mixed-method design to investigate choice in exercise motivation and physical activity. The results showed a significant effect over time for physical activity, with participants being more active at the end of the semester. However, there was a slight decrease in physical activity from the choice sections between the mid-point and end of the semester. The authors hypothesized that the decline might be due to the participants' intensity levels during the activity days within the last week of classes, while the instructor led the non-choice group's activity (Tracy et al., 2017).

Regarding preference of choice, all but one participant in both groups preferred the freedom of choice. The instructors from both groups also perceived that some form of choice allowed students a more positive experience. This study adds to the physical activity course literature about being a tool to improve health and physical activity in young adults.

Course Interventions

Baghurst and Kelley (2014) explored how different interventions could reduce college students' stress over a 16-week semester. Five hundred and thirty-one participants (male $n = 293$; female $n = 238$) were recruited from existing courses within the university curriculum. Participants were recruited from the Stress Management, Physical Activity, and Cardiovascular courses for the treatment group. Students in the treatment group were randomly assigned to a treatment. The control group consisted of students taking

academic courses in history, sociology, and geography and did not emphasize stress, fitness, or activity. The intervention groups were assessed on the variables of Perceived Stress (Perceived Stress Scale [PSS], Cohen et al., 1983), Test Anxiety (The Test Anxiety Survey ([TAS], Martens et al., 1990), and Personal Burnout (The Personal Burnout Scale [PBS], Kelley, 2007). The control group was not assessed for any self-selected activity they may have participated in during the study (Baghurst & Kelley, 2014). Besides the stress management class, participants in the physical activity and cardiovascular fitness groups during the second week of the semester received 30-minute stress management and test-anxiety reduction presentation. The participants did receive a packet of materials after the presentation.

In their results, Baghurst and Kelley (2014) found that 47% of participants participated in a regular exercise program, and 45% reported using exercise to reduce stress. Those who participated in a regular exercise program had lower perceived stress levels and burnout at the beginning than at the end compared to those who did not exercise. Additionally, those who exercised specifically to reduce stress were higher in test anxiety than those who used exercise for fitness and enjoyment.

Other results included the physical activity group seeing a significant reduction in students' stress but only slightly less than the stress management group that included components such as cognitive-behavioral exercises, lectures, exercise, wellness participation, and others (Baghurst & Kelley, 2014). The results could have differed due to various individuals' exercise preferences for motivation, style, activity, and environment. Out of the treatment group,

cardiovascular fitness was the least effective, which is interesting considering that cardiovascular fitness is viewed as a recommendation for stress reduction. An individual's fitness level should be considered when identifying what exercises would be the best to lower stress. Overall, they did not significantly increase or decrease test anxiety or personal burnout for the control group. A limitation of this study includes having multiple instructors with attributes (e.g., teaching styles, physique, or stature, etc.) that could affect participants' outcomes. Another limitation consists of the authors not exploring the control group's physical activity levels. Their physical activity levels may have impacted results and why there were no significant changes. This study contributes to the literature on physical activity courses and their ability to reduce stress among college students.

Quartirola and Maeda (2016) used an integrated perspective of the Theory of Planned Behavior (TPB) and the Self-Determination Theory (SDT) to understand the possible relationship between college students' participation in a mandatory 15-week lifetime physical fitness (LPF) course and their engagement in the health behaviors. Many of the 58 participants met the recommended physical activity guidelines (VPA 63%; 34.2%) and consumed the suggested nutritional guidelines (94.5%). The students' physical activity was measured by a four-item questionnaire that focused on how frequently students engaged in physical activity. The other measures used included the Basic Psychological Needs in Exercise Scale ([BPNES], Wilson et al., 2006), the Behavioral Regulation in Exercise Questionnaire-2 ([BREQ-2], Markland & Tobin, 2004), and the Motivation for Physical Activity Measure – Revised: The MPAM-R (Ryan et al., 1997), and a multi-item scale about participation in regular physical activity to measure TPB. The data were analyzed using descriptive statistics, paired t-tests, and a

two-tailed Pearson correlation.

Quartiroli and Maeda (2016) found no statistically significant changes in the participants level of physical activity participation; this may be due to the already high levels of reported physical activity participation by participants. They also reported that students' intrinsic motives to be active (competence and engagement) did not change. Still, their extrinsic motivators (appearance and fitness) to engage in active behaviors decreased over time. The measures used in this study were administered during the first and last week of the course. They impacted the results because participants may have switched their academic priorities instead of engaging in physical activity. This study also lacks a control group, so it is difficult to know its effects on students who have never taken the course. Nevertheless, this study helps to understand physical activity on courses usefulness to college students and how physical activity courses can shift students' motivation to participate.

Leal et al. (2019) also examined the behaviors of college students related to physical activity. However, instead of reviewing an LPF course, they looked at a required health and wealth course at a liberal arts college. The authors also explored students' physical activity beliefs and attitudes. The course included an in-class physical activity, interactive lectures, and out-of-class readings. All students at the university were eligible to participate in this survey design. The 15 survey questions were developed under the three models of behavior change: The Health Belief Model (HBM), the Precaution Adoption Process Model (PAPM), and the Transtheoretical Model (TTM) to quantify student's beliefs and behaviors regarding physical activity. Descriptive statistics, ANOVAs, and chi-squared tests

analyzed the data.

The study included 408 students who completed the online survey, which made up 19.9% of the overall student body (Leal et al., 2019). Of the 408 students who participated, 217 had taken or were currently enrolled in the course, while 191 had not yet taken the course. Their results determined that the required health and wellness course was an effective intervention for healthy behavior change, creating confidence in student's ability to improve their physical fitness, having students meet the required recommended federal guidelines for physical activity, and increasing their physical activity compared to students who had not taken the course. This study provides background into how required health and wellness courses can positively impact a student who takes this course compared to those who do not. While also emphasizing a study that focuses on required health and wellness courses versus studies that do not focus on required courses.

Physical Activity and Wellness

Students with high exercise self-efficacy beliefs are more likely to perceive overall wellness, physical, spiritual, intellectual, psychological, and emotional wellness, according to Sidman et al. (2009). Therefore, they examined the relationship between university students' exercise self-efficacy on their perceived wellness while enrolled in a basic studies lifetime physical activity and wellness course. The 611 participants were recruited while participating in a required physical activity and wellness course focused on developing knowledge, skills, and attitudes to facilitate health and wellness behaviors. The survey design study had students complete the following instruments: the Perceived Wellness Survey (PWS) and the Self-Efficacy and Exercise Habits Survey. Results were analyzed using descriptive statistics, bivariate analysis, and a standard multiple regression

model to assess the contributions of variables in predicting perceived wellness and the subscales of wellness revealed in the bivariate correlations.

The authors discovered that exercise self-efficacy was significantly related to overall wellness and all subscales. However, social wellness was not associated with exercise self-efficacy (Sidman et al., 2009). The regression results indicated that exercise self-efficacy was a significant predictor of physical, spiritual, intellectual, psychological, and emotional wellness. Because the study was a cross-sectional design, the generalizability of the results is limited. The course content could have a confounding effect on the student's survey responses. The constructs (e.g., self-efficacy) used in this study differ from my study. Nevertheless, this study is applicable in exploring how courses emphasizing wellness and physical activity can impact students' overall wellness.

Milroy et al. (2013) investigated college students perceived wellness among different delivery formats of a required university health-related fitness course. Students enrolled in online and hybrid courses had higher perceived wellness than face-to-face students. In addition, students self-selected the course delivery format best fitting their learning style, physical activity preference, computer literacy, and motivation.

Milroy et al. (2013) noticed that online students were older and more likely to be employed. Online students in the lab and lecture sections had significantly higher scores for three wellness dimensions and total perceived wellness. Online lab students reported a higher psychological, emotional, and intellectual wellness perception. Students in online and hybrid formats were more likely to feel optimistic, have positive life expectations, report positive

perceptions of their self-image and self-regard, engage in stimulating mental activities, and have a more positive perception of their overall wellness. Online students had significantly higher PWS scores for psychological, emotional, social, and total scores for lecture sections. Online students were stronger in the internal dimensions of wellness, including psychological, passionate, & intellectual. The online delivery format of a course may be appealing to students with already high perceived wellness because online is associated with increasing autonomy and self-directedness, which are wellness components.

Marinero (2019) investigated the impact of a 15-week fitness and wellness course on perceived wellness in emerging adults. A convenience sample of undergraduate students enrolled in a general education Lifelong Fitness and Wellness class completed an instrument consisting of the PWS, the BREQ-2 (Markland & Tobin, 2004), and demographic questions at the beginning and end of the Fall 2018 semester. First, a confirmatory factor analysis assessed the goodness of fit for participants' responses on the PWS to the proposed model. Then the data was analyzed using a pre-test/post-test design. A 21-item, six-factor model was retained after dropping reverse-worded items. Mixed covariance analyses revealed improvements in overall emotional, and physical wellness from pre-test to post-test with no impact of lecture delivery mode or activity participation type. The results indicated that general education wellness and fitness class might positively impact perceived wellness in the college student population.

Comparisons were made based on select demographic characteristics and enrollment in specific course features (i.e., lecture delivery mode, activity participation type). Thus, all participants were engaged in the course-based intervention, and intact groups were used to ground the analyses (Marinero, 2019).

Lothes (2020) also examined the effects of a course on college students' overall wellness for a semester. The author studied physical education courses that consisted of a face-to-face laboratory and an online lecture. The face-to-face laboratory allowed students to sign up from over 40 classes, including martial arts, strength and conditioning, aerobic exercise, and yoga. Participants were also given assignments and readings through Tophat's online book. The online lecture addressed items that were specific to the 12 dimensions of wellness. Participants were assessed at the beginning of the semester and at the end using The Wellness Inventory (Travis, 2004). The results showed that students' wellness across the 12 dimensions significantly increased from the semester to the end. Further, students who ranked themselves as excellent in the pre-test also improved their wellness, showing promise that physical education courses can assist with moving students in the direction of wellness.

Joseph et al. (2014) examined the relationship between physical activity and young adults' quality of life. They mainly focused on how one's view of self and exercise self-efficacy, physical self-esteem, and affect are potential influences on a person's quality of life. Physical activity was measured with the Godin Leisure-Time Exercise Questionnaire ([GTLQ], Godin & Shepard, 1985), and satisfaction has assessed the quality of life with Life Scale ([SWLS], Diener et al., 1985). Joseph et al. (2014) identified that physical activity's strongest pathway and quality of life was physical self-esteem. Exercise self-efficacy was indirectly associated with quality of life through variables of physical self-esteem, positive affect, and negative affect. Physical self-esteem was the only variable that showed a significant association with all the model variables. Physical self-esteem and

positive effects strongly link physical activity and quality of life. According to Joseph et al. (2014), their findings suggest that health education programs that promote regular physical activity and enhance physical self-esteem may improve the quality of life in young adults and college-aged populations.

Research with Physical Activity and Mental Health

Roychowdhury (2020) suggests that interventions on physical activity participation should examine the motivational and enjoyable aspects of physical activity involvement, particularly with individual activity. Stanton et al. (2014) stated that there need to be more self-report instruments that capture data about the different modes of exercise, which may impact how physical activity sessions are classified. The authors also addressed the need to have objective measures of physical activity intensity levels that will help with understanding what is quantified as “light,” “moderate,” and “vigorous.” Objective measures will help when trying to create tailored interventions. Creating tailored interventions ensure that individuals will engage in the activity, maximize satisfaction, and reduce the possibility of participants dropping out.

Participants’ mental health symptoms can be challenging to determine in research due to multiple diagnostic instruments with different cutoff identifiers for diagnosis or relying on participants to self-report their symptoms (Stanton et al., 2014). This can be difficult, especially when identifying what interventions and instruments apply to a specific diagnosis. The difficulty of determining participants’ mental health symptoms also can also impact the study’s rigor.

In explaining mental health changes through physical activity, there is a need for greater experimental rigor and control, especially with randomized control trials, the need for more long-term studies, more clinical trials, as well as a need for qualitative designs

to gain a greater understanding from individuals (e.g., mental health service users) that are benefiting from the treatments or the ones providing the service (Aylett et al., 2018; Faulkner & Carless, 2006; Zschucke et al., 2013). Other methods should be included in the research because it does not allow for understanding all the benefits possible with this topic.

There needs to be more exploration between physical activity types and the prevention of depression (Mammen & Faulkner, 2013). When exploring studies regarding depression and exercise, many report small sample sizes, short study durations, inadequate control group limits, inconsistent definitions of depression, and various psychological measures (Paluska & Schwenk, 2000). Their review of physical activity and mental health reported that community-based studies using a nonclinical population had less of a clear association between increased physical activity and improved mood (Paluska & Schwenk, 2000). They also discovered in the literature that using nonclinical depressed populations was challenging to generalize the findings due to multiple study designs, research populations, psychological measures, and intervention duration limitations. The authors also expressed a need for large population-based, well-controlled studies (Paluska & Schwenk, 2000).

Further exploration of anxiety-reducing treatments, short study durations, and inconsistency among participant selections weaken many studies' findings (Paluska & Schwenk, 2000). Researchers have also used differing anxiety rating scales instead of DSM criteria subsequently limiting their conclusions. Moreover, good control groups have been significantly lacking. Although consistent relationships between exercise and anxiety levels have been noted, most authors

emphasized that their research has substantiated no causal effect in alleviating anxiety symptoms (Paluska & Schwenk, 2000).

Wellness

There is no universal definition for the term wellness. However, much of the literature defines wellness as obtaining optimal functioning (Brymer et al., 2012; Roscoe, 2009). For this study, wellness is described as a multidimensional and holistic approach encompassing lifestyle, mental and spiritual well-being, a conscious, self-directed, and evolving process of achieving full potential aligned with a set of value aspirations (Goss et al., 2010). Striving to obtain optimal functioning or full potential does not mean being free from illness and disease. According to Rachele et al. (2014), “wellness is an integrated construct that is determined by behaviors that facilitates a person’s journey toward optimal states on multiple dimensions” (p.282). Depending on the wellness model, wellness dimensions may include social, emotional, physical, intellectual, spiritual, psychological, occupational, and environmental.

The literature on wellness includes numerous models. Wellness models have transitioned from an illness-based medical model to focusing on an individual’s choices and how they impact their health, along with preventive care (Myers et al., 2000; Oliver et al., 2018; Savolaine & Granello, 2011). The most common wellness models found in the literature are Dunn’s High Level of Wellness, Hettler’s (1984) Hexagonal Model of Wellness, and Myers and peers’ (2000) Indivisible Self. Additionally, extensive literature explored the various wellness models (Blount et al., 2020; Oliver et al., 2018; Roscoe, 2009). Therefore, for this review, I focused on Hettler’s (1980) Hexagonal Model of Wellness because this model will help explain college student wellness.

Hettler’s (1980, as cited in Roscoe, 2009) wellness model conceptualizes that an

individual must be aware of wellness and engage in activities that contribute to healthy living. Hettler integrated social, spiritual, physical, intellectual, emotional, and occupational dimensions in a multidimensional model. The interaction between dimensions affects life quality and leads to holistic wellness. Oliver et al., 2018 refer to holistic wellness as “the condition of being in optimal health in which aspects of wellness contribute to overall wellness.” According to Goss et al. (2010), Hettler’s Six Dimensions of Wellness have the characteristics to help university students understand wellness. It allows them to feel like they have control and make life choices to enhance their health.

Gieck and Olsen (2007) used Hettler’s model of wellness to examine the effects of incorporating principles of holistic wellness into a pilot 11-week walking program among a sample of obese and sedentary college students. They developed a 31-item assessment to assess participants’ knowledge of holistic wellness principles, their self-efficacy concerning their ability to use them daily, and their activity levels. From their results, Gieck and Olsen (2007) discovered that a holistic health model helps increase activity and short-term adherence to a lifestyle approach to health. In a one-month follow-up with participants, the data showed that most participants who completed the intervention continued to engage in behaviors consistent with a holistic model of wellness. The authors noted that further examination is needed to understand which type of model/theory works to create behavior change. This study adds to the literature on wellness impacting students engaging in physical activity.

Hettler’s model of wellness was used with physical activity, as well as in other areas such as workplace wellness with university administrators (Ignacio,

2013), older adults' wellness priorities (Strout et al., 2018), and adapting a fertility care wellness model (Olerich et al., 2021). In addition, Beauchemin et al. (2018) examined the relationship. Understanding a person's wellness can help professionals guide people to connect healthy behaviors and values or perceptions that they hold, which can be a strong motivator for adopting healthy behaviors (Bezner, 2015).

Theoretical Framework

There have been many kinds of theories and methods that help to explain mental health changes through physical activity. However, no single framework or mechanism can help explain why this change occurs (Faulkner & Carless, 2006). The four key theoretical frameworks applied to understand and change physical activity are social-cognitive, humanistic, dual process, and socioecological (Rhodes et al., 2019). Moreover, the mechanisms to explain physical activity's psychological changes have fallen into one of the following categories: biochemical, physiological, or psychological. The difficulty of not having a consistent mechanism to explain the differences has made it challenging for mental health professionals to accept physical activity as a viable treatment option. However, even in traditional mental health treatment, there is no one-size-fits-all for changes that occur. Understanding that multiple mechanisms and frameworks can explain mental health changes through physical activity, this study will focus mainly on the Self-Determination theory.

Self-Determination Theory

The self-determination theory ([SDT] Deci & Ryan, 1985; Deci & Ryan, 2000a) is about motivation focusing on individual and social factors influencing people to reach growth and well-being. There are two critical assumptions about self-determination theory. The first is the need for change to drive behavior. When people can understand

what they are doing and experience new things, they will better understand who they are. The other fundamental assumption of self-determination theory is that autonomous motivation is essential. Autonomous motivation must deal with motivation coming from both internal and extrinsic motivation. In contrast, on the other hand, controlled motivation is about an individual acting on external regulation. Extrinsic motivation helps motivate people, but self-determination theory focuses on how intrinsic motivation allows people to feel more interested and satisfied with what they like to do.

Self-determination theory identifies motivation as a continuum (Deci & Ryan, 2000). An intrinsically motivated person is deemed highly autonomous and will engage in physical activity due to the pleasure, accomplishment, and experience of sensations (Zhang et al., 2012). An extrinsically motivated person performs or participates in physical activity because of the associated outcome or rewards more than physical activity itself. Four types of motivation fall under extrinsic motivation. These four extrinsic motivation types are integrated regulation, identified regulation, introjected regulation, and external regulation. Integrated regulation focuses on a person who engages in behaviors related to who they are and what they value. This person has done a self-assessment and chooses to engage in activities related to how they see themselves. Identified regulation deals with people engaging in behaviors performed out of choice. The behavior may not be pleasant, but the person who chooses to engage tends to be self-initiated (Zhang et al., 2012). In another type, introjected regulation, people engage in behaviors to achieve social recognition, avoid internal pressures and feelings of guilt, or please others. The last type of extrinsic motivation is external

regulation, which deals with people engaging in behaviors or situations to receive a tangible reward or avoid punishment. Along with intrinsic and extrinsic motivation, an individual can be amotivated. Amotivation can occur when one does not value activity or lacks direction.

Self-determination theory comprises five-mini theories: causality orientations, goal contents, cognitive evaluation, basic psychological needs, and organismic integration. According to Rhodes et al. (2019), these five theories help to understand motivation by taking into consideration:

Individual differences in one's tendencies towards motivation (causality orientations theory); (2) the type of goals that individuals strive to attain (goal contents theory); (3) the conditions in one's environment that can impact one's motivation (cognitive evaluation theory); (4) the psychological needs that each individual has to motivation (basic psychological needs theory); and (5) individuals' innate tendencies to engage in interesting activities and to refine their inner representation of themselves (organismic integration theory). (p. 102)

Understanding that the self-determination theory comprises five-mini theories, the literature review mainly focused on the mini-theory of the basic psychological needs.

The basic psychological needs of self-determination theory are autonomy, competence, and relatedness. The need for autonomy is defined as an individual's need to have choice and volition. Autonomy in self-determination theory does not equate to independence or individualism. Still, those individuals have a sense of choice that can be supplemented with any act (Ryan & Deci, 2000b). When autonomy is associated with individualism and independence, it can indicate low relatedness (Ryan & Deci, 2000b). Relatedness is the need to feel connected and supported by others. Meaningful

relationships and caring for or being cared for are essential. Competence is the feeling of effectiveness and engagement in activities that are important in their life. The need for competence is usually associated with self-efficacy and the person's ability to feel confident in what they are doing. It also relates to one's ability to have mastery experiences.

The basic psychological needs must be met to achieve psychological growth and well-being (Ryan & Deci, 2000b; Zhang et al., 2012). Ryan and Deci (2000b) stated that when our psychological needs are unmet, it can lead to anxiety, grief, hostility, and other negative emotions. Self-determination theory suggests that one must develop a greater awareness of their basic needs and do the work to help lessen these feelings. In a meta-analysis of self-determination theory's basic psychological needs, Van den Broeck et al. (2016) discovered that the basic psychological needs in self-determination theory predict psychological growth, internalization, and well-being. However, there is criticism that basic psychological needs predict "identified and intrinsic" forms of motivation better than "external or introjected" forms of motivation with well-being.

It is important to note that competence, autonomy, and relatedness look different for everyone. Cultural values and behaviors are considered when determining psychological-need satisfaction (Ryan & Deci, 2000b). They are also not interchangeable and cannot compensate for one another. When using the measures of Deci et al. (2001) and Van den Broeck et al. (2010), Van den Broeck et al. (2016) recommended not combining the three basic needs scales into an overall scale due to basic psychological needs not being considered interchangeable. However, the authors stated that they understand when some

studies combine the scales into an overall scale due to the correlations between the measures and some analyses used. Therefore, there is a need for more empirical and theoretical work to explore this model.

Self-determination theory's basic psychological needs are applicable in addressing student wellness and psychological distress among students. Further, self-determination theory was applied to general issues concerning well-being versus ill-being. Ryan and Deci (2000b) defined well-being as a self-determination theory characterized by a fully functioning person and takes a eudemonic perspective instead of a hedonic one. In their development of self-determination theory, Ryan and Deci (2000b) noticed that when individuals were able to achieve extrinsic aspiration or succeed in an activity in a control condition, they saw people could be happy, but they lacked eudemonic well-being. Ryan & Deci (2000b) noted that:

The pursuit and attainment of aspirations such as meaningful relationships, personal growth, and community contributions—aspirations that are closely aligned with basic psychological needs—tend to promote the fuller, more enduring, and a deeper sense of well-being described by the term eudaimonia. (p. 323)

Under self-determination theory, basic psychological needs are considered antecedents of well-being rather than indicators. While in the present study, whether students are engaged in physical activity courses or not, the self-determination theory will help explain whether students experience higher psychological distress or less wellness due to their unmet psychological.

Under the framework of organismic/humanistic, the self-determination theory perspective on growth and development is applied to understand physical activity

(Rhodes et al., 2019). Another view of self-determination theory is that people are motivated to engage in physical activities that will lead them to growth and well-being if their basic psychological needs are met (Deci & Ryan, 2000; Ryan & Deci, 2002; Zhang et al., 2012). When someone's need is unmet, it can contribute to deficits in a person's overall wellness; however, it will make them feel well (Ryan & Deci, 2000). According to Ryan & Deci (2000), an example is when someone is not showing initiative or care. They suggest that the individuals' immediate social environments should be examined first and then their developmental environments to understand why their needs for competence, autonomy, and relatedness are being prevented.

Sweet et al. (2012) tested and integrated the self-determination theory with the self-efficacy theory (SET) to predict physical activity for a cross-sectional study with university students completing questionnaires to measure self-determination theory and self-efficacy theory constructs. Some of the measures used in this study included The Godin Leisure-Time Exercise Questionnaire ([GLTQ], Godin & Shepard, 1985), the Psychological Need Satisfaction in Exercise Scale, and the BREQ-2 (Markland & Tobin, 2004). The researchers tested the self-determination and self-efficacy theories individually, and then two hypothesized integrated models were tested. The second hypothesized integrated model had competence/self-efficacy take on an agentic role depicted in self-efficacy theory and was the better model out of the two integrated models and was the preferred model over the individual theoretical model. This study showed the feasibility of integrating two theories to understand physical activity. At the same time, the integrated model could also account for variance in physical activity,

self-determined motivation, and confidence (Sweet et al., 2012).

Ntoumanis et al., 2020 conducted a meta-analysis of 73 studies examining the impact of health-domain interventions informed by self-determination theory constructs and health indices. The authors determined that self-determination theory-based interventions positively impacted health behaviors physical and psychological health. Self-determination theory-based interventions promoted psychological health among participants at the end of the intervention period, but there was no benefit in interventions that completed a follow up. Studies that utilized two techniques were considered to provide autonomy support, produce larger effect sizes at the end of the intervention, and follow-up than studies that did not. However, Ntoumanis et al. (2020) noticed that studies utilizing various competence-support type strategies yielded smaller effect sizes on psychological health than studies that did not. Furthermore, studies incorporating one-to-many intervention delivery approaches yielded more significant psychological health outcomes at follow up than those using other delivery modes. Most of the included studies in this meta-analysis focused primarily on physical activity promotion.

Summary

The literature review of this study explored the impact of college student's mental health, the benefits of physical activity on an individual's mental health, the history of physical activity courses and the benefits that they provide for students who participate in them, the history of wellness mainly focusing on Hettler's model of wellness, and Self-determination theory's basic psychological needs as a theoretical model for explaining how a person's engagement in physical activity affects their wellness. Furthermore, Chapter 3 will discuss and give an overview of the methodology, sample population, data collection methods, statistical analysis, the researcher's role, criteria for selecting

participants, and a discussion of the ethical protection of participants.

CHAPTER 3

METHODOLOGY

The purpose of this study was to investigate whether college students' engagement in physical activity courses impacts their basic psychological needs, overall wellness, and psychological distress symptoms. This chapter focuses on the research design, the hypotheses, the participants, the setting, the instrumentation, the procedures, and the data analysis used for this study.

Research Questions and Hypotheses

I tested the following questions with the statement of hypothesis related to each question:

1. Do college students enrolled in university-based PA courses report higher levels of basic psychological needs satisfaction compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report higher levels of basic psychological needs compared to students who have never taken a university-based PA course.

2. Do college students enrolled in university-based PA courses report higher levels of wellness compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report higher

levels of wellness compared to students who have never taken a university-based PA courses.

3. Do college students enrolled in university-based PA courses report lower levels of psychological distress compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report lower levels of psychological distress compared to students who have never taken a university-based PA course.

Research Design

For the study, I used a casual-comparative survey design. A casual comparative or ex post facto design involves no independent variable manipulation, and participants are not randomly assigned to conditions like in true experimental designs. Instead, the design attempts to identify a cause-effect relationship between independent and dependent variables after an action or event has already occurred (Salkind, 2010). It allows for the design to take place in naturally occurring settings, requires fewer resources, and allows for the exploration of real-world effectiveness (Schweizer et al., 2016).

The absence of randomization within a causal-comparative design limits the design's ability to allow for the exploration of causality inference. The present study lacked manipulation of the independent variable because participants were not randomly assigned to groups. Instead, participants were assigned based on whether they were enrolled in a PA course. Therefore, I did not collect baseline data for this study, and to control for potential extraneous variables, I conducted a

multivariate co-analysis of variance (MANCOVA). According to Rovai et al. (2014), trying to control for extraneous variables with a casual-comparative design improves the credibility of the design in comparison to similar pre-experimental non-equivalent group posttest-only designs.

According to Heppner et al., 2016, a casual-comparative design allows applied researchers flexibility. In comparison to other designs, this design is cost-effective and feasible. Additionally, it allowed for the design to take place in naturally occurring settings. While casual-comparative designs may be convenient, Rovai et al. (2013) stated that this design is less disruptive to participants and the researcher. The stated reasons and the time-sensitivity of this study are why a casual-comparative design is a practical approach for this study.

Also incorporated in this study was a cross-sectional survey design to quantify variables (i.e., basic psychological satisfaction needs, wellness, and psychological distress). A cross-sectional survey design is a type of quantitative descriptive design. A quantitative descriptive design can help describe possible relationships among variables (Heppner et al., 2016). This design allows the researcher to gain a greater understanding of explaining a phenomenon. Moreover, a survey research design can enable the researcher to explore the relationship between two or more variables without manipulation (Heppner et al., 2016; Privitera & Ahlgrim-Delzell, 2018).

Survey design provides a description, explanation, or exploration of a phenomenon and, like the casual-comparative design, does not require manipulation of the independent variable (Heppner et al., 2016). This design is descriptive and inferential. Descriptive analysis helps researchers describe and summarize the data. At the same time, inferential analysis helps make predictions based on the collected data. A cross-

sectional survey was applicable for this study because data were collected at one point to represent the larger population and used descriptive and inferential analysis to describe and explain the data collected. A cross-sectional survey and casual-comparative designs helped to understand the relationship between college physical activity courses and students' basic psychological needs, wellness, and psychological distress.

Participants

The target participants for this study were college students (e.g., undergraduates) attending a United States post-secondary institution. Graduate students were not included in this study because this population of students has already earned their bachelor's degree and is less likely to be enrolled in physical activity courses. The post-secondary institution offered a physical activity or health-related fitness program with courses in the following categories: aquatics, dance and rhythm, fitness and conditioning, outdoor activities, and sports. Courses offered in these categories fell under the recommended moderate-intensity aerobic or vigorous-intensity exercise (Piercy et al., 2018). Previous research classified these course categories (Kim & Cardinal, 2019). The physical activity or health-related fitness program offered course credit that individuals could take towards earning a degree. Eligible participants were placed into two groups, students who have taken a physical activity course during the Fall 2022 academic year and students who have not taken any physical activity courses.

Eligibility

All eligible participants in this study were at least 18 years old and currently enrolled at the selected post-secondary institution within the United

States. The post-secondary institution where participants were enrolled has a physical activity or health-related fitness program where they can earn course credit towards their bachelor's degree. Individuals who attended an institution that did have a physical activity or health-related fitness program but did not provide them the ability to earn course credit were not eligible for this study. Participants who must take physical activity courses for degree completion were not eligible to participate. Students required to take physical activity or health-related fitness program courses may not feel satisfied with having to take the course for degree completion, which may skew the data. Students who choose physical activity courses as an elective tend to be more motivated than students required to take courses (Kim & Cardinal, 2017, 2019).

Eligible participants in the physical activity course group must have taken a physical activity course during the Fall 2022 academic year at the time of their participation in the study. Previously enrolled students who had taken a physical activity course or the course they were taking was outside one of the following categories: aquatics, dance and rhythm, fitness and conditioning, outdoor activities, and sports, and they were ineligible to participate in this study. These students may or may not benefit from the effects of the previous course. These students may also experience a carryover effect from their last participation in the physical activity courses. Not including these students will help control the potential threat to external validity due to history, treatment, and extraneous variables. Students who simultaneously enrolled in multiple physical activity courses were not eligible to participate in this study. Enrollment in more than one physical activity course may skew the data because participants may appear more motivated by taking more than one class at a time. Participants diagnosed with a mental health disorder and those experiencing symptoms related to psychological distress were

eligible to participate.

Sample Size

I conducted an *a priori* power analysis using G*Power 3.1 (Faul et al., 2009) to determine the sample size and adequate power. According to D'Amico et al. (2001), a priori power analysis allows researchers to design better studies and decide what resources are needed based on the researcher's design. Furthermore, power is the probability that a significance test would reject the null hypothesis correctly (Cohen, 1992). There are two types of errors if the wrong conclusion is rejected. A Type I error is when the researcher incorrectly rejects the null hypothesis instead of failing to reject the null. At the same time, a Type II error exists when the researcher fails to reject the null hypothesis when it should be rejected. Adequate power can reduce the probability of making a Type II error.

The significance criterion (alpha level), the effect size, and the number of participants is needed to decide power. The significance criterion (alpha level) minimizes the probability of mistakenly rejecting the null hypothesis. The effect size is the discrepancy between the null and alternative hypotheses and aids in identifying whether there is a true effect. The sample size helps to detect an effect of a specified size. Finally, a power analysis helps determine the number of necessary participants (Sawyer & Ball, 1982).

The *a priori* analysis utilizes an alpha level of .05, a medium effect size of .06 (Cohen, 1992), and a recommended power of .80 (Cohen, 1992). The *a priori* analysis provides a minimum sample of 180 college students to achieve adequate power to detect medium effects. However, the final sample included 172 participants. The group of students in the physical activity courses included 90

participants, and the group of students who had never enrolled in physical activity courses was 82. My goal was to recruit at least 290 participants (145 per group) to avoid Type II error, account for participants dropping out of the study, and have a possible low response rate.

Description of Sampling Method

The study aimed to examine the impact of physical activity course participation on wellness, psychological distress, and the basic psychological needs of college students. Testing the whole population of college students would require a lot of time and resources. Unfortunately, due to the time-sensitivity of this study, testing the entire population of college students was not feasible. The convenience sampling method was the best since the groups of students were not randomly assigned. Farrokhi and Mahmoudi-Hamidabad (2012) mentioned that psychology and social sciences researchers could only sometimes afford to satisfy the requirement of randomizing with studies mainly dealing with human subjects. Convenience sampling is a type of nonrandom sampling where participants from the target population are selected by meeting specific selection criteria based on accessibility and/or proximity to the research (Dörnyei, 2007). Convenience sampling is also known for being inexpensive and feasible (Etikan et al., 2016). Utilizing this sampling method allowed participants who met eligibility criteria to participate in the study, improving the ability to recruit the required sample size.

Instruments

Participants completed all instruments online using Qualtrics. The data collected were exported to SPSS for analysis.

Demographic Questionnaire. I provided participants with a demographic questionnaire to describe the participant sample (see Appendix D). The demographic

questionnaire included questions asking participants to identify their current class standing (e.g., first-year, second-year student), age, gender, college/school major, racial-ethnic identity, whether they are currently taking a physical activity course, and if so, which category (e.g., aquatics, dance and rhythm, fitness and conditioning, outdoor activities, and sports).

Kessler Psychological Distress (K10). The K10, a 10-item self-report questionnaire, was developed by Kessler et al. (2002) to measure the level of distress and severity associated with psychological symptoms over the past four weeks. The questionnaire uses a 5-point Likert response scale that ranges from 1, *"None of the time,"* to 5, *"All of the time."* Scores range from 10-50 and are categorized into three levels: low (10–15), moderate (16–21), and high (22–50). The Cronbach's alpha for the K10 was 0.93 in the telephone pilot survey and 0.92 in the National Survey of Mental Health and Wellbeing. The K10 had good precision in the 90th-99th percentile range of the population distribution (standard errors of standardized scores in the range of 0.20–0.25) and consistent psychometric properties across major sociodemographic subsamples. In addition, the scales strongly discriminated between community cases and non-cases of DSM-IV/SCID disorders. The purpose of using the K10 was to assess psychological distress among participants. See Appendix E for K-10.

EUROHIS-QOL. Schmidt et al. (2006) developed the EUROHIS-QOL 8-item index as an adaptation of the World Health Organization Quality of Life 100-item (WHOQOL-100) and the World Health Organization Quality of Life (WHOQOL-BREF) to measure an individual's perception of their health and well-being. An eight-item, self-administered questionnaire scored on a five-point

Likert scale from 1, “Not at all,” to 5, “Completely.” The domains represented are physical, social, psychological, and environmental, with two questions devoted to each dimension. The score ranges from 8 to 40. A higher score indicates a greater quality of life. The total scale of internal consistency was .80 in the United States (Rocha et al., 2012). Discriminant validity was conducted between depressed and nondepressed patients (CES-D score ≥ 16 and positive CIDI for major depression—*Diagnostic and Statistical Manual of Mental Disorders* (4th ed.), criteria. The EUROHIS-QOL 8-item was found to be significantly discriminated by the collected sample. Meanwhile, Rocha et al. (2012) assessed for convergent validity of the EUROHIS-QOL 8-item with different mental, physical, and Quality of life measures. All measures were found to be significant ($P < 0.001$). EUROHIS-QOL 8-item had the strongest correlation with the WHOQOL-BERF domains, physical = 0.73, psychological = 0.77, social = 0.61, and environment = 0.72). The purpose of using the EUROHIS-QOL was to assess the wellness of participants. See Appendix B for EUROHIS-QOL.

Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS). The BPNSFS (Chen et al., 2015) is a self-report questionnaire that measures whether basic psychological needs for autonomy, competence, and relatedness are satisfied or frustrated, which must be met to have basic psychological need satisfaction according to the Self-Determination Theory (Ryan & Deci, 2017). The BPNSFS is a 24-item scale with six dimensions (autonomy satisfaction, autonomy frustration, relatedness satisfaction, relatedness frustration, competence satisfaction, competence frustration) containing a five-point Likert response ranging from 1, “*completely untrue*,” to 5, “*completely true*.” Each question corresponds to one of the dimensions. The scoring consists of the total scores for questions regarding that dimension. Items worded

negatively (the frustration scales) will be reversed, scored, and averaged on the relevant subscale. A higher score indicates a high level of need satisfaction of frustration.

The explanatory factor analysis (EFA) confirmed the six factors. Internal consistency ranged from .64 to .89 for each tested country (China, Belgium, Peru, and the United States) (Chen et al., 2015). The internal consistency for each BPNSFS English version subscale was .83 for relatedness satisfaction, .88 for competence satisfaction, .81 for autonomy satisfaction, .81 for relatedness frustration, .86 for competence frustration, and .71 for autonomy frustration. The BPNSFS has been validated in languages, such as German, Portuguese, and Chinese.

Previous studies explored the population of college students and the satisfaction of their basic psychological needs and their engagement with physical activity and health (Valenzuela et al., 2021; Visser & Hirsch, 2014; Wilson et al., 2009). Therefore, the purpose of using the BPNSFS was to assess basic psychological needs satisfaction among the participants (see Appendix C).

Procedure/Data Collection

Recruitment

I obtained approval from the University of South Carolina's Institutional Review Board (IRB) before recruiting for the study. After acquiring permission from IRB, I contacted staff and faculty from the University of South Carolina (U of SC) to gain access to the population. In recruiting participants for my study, an active (direct interaction with participants) and passive (non-direct interaction with participants) approach was used. These recruitment strategies allowed for a

higher enrollment rate of participants and the opportunity to meet the recommended sample size (Patel et al., 2003). To gain access to students enrolled in physical activity courses, I contacted the current Physical Activity Program Director, and I obtained a list of students in the categories of physical activity courses that I examined for this study. I then contacted students via email to recruit participants.

Meanwhile, to recruit participants who were not currently enrolled in physical activity courses, I reached out to faculty and staff in other departments at the university. I was able to use my relationships with individuals within the College of Education, the Psychology department, the College of Hospitality, Retail, and Sport Management, and the Arnold School of Public Health to obtain permission to visit their classrooms and/or contact students via email to recruit participants for my study. I also asked if these individuals knew of other faculty members or instructors who would allow me to come to their classes or contact students via email to recruit participants —obtaining access to potential students in different majors and programs allowed for a more diverse population sample. Visiting potential participants face-to-face increased participation rates (Fowler, 2014). While visiting potential participants at their classes, I hoped to obtain the number of participants needed for this study.

Data Collection

Student recruitment occurred at UofSC due to proximity and accessibility to the study's target population. I obtained permission from faculty and staff within the colleges and departments of the College of Education Program, the Psychology department, the College of Hospitality, Retail, and Sport Management, and the Arnold School of Public Health to visit their classrooms and contact students via email (e.g., Introduction to Counseling, Swimming, Zumba, Introduction to Health Promotion, Education, and

Behavior, Sport Psychology, etc.) to introduce and recruit potential participants. Interested participants were provided a survey link via Qualtrics to complete the survey online. The survey included the consent form, demographics questions, K10, EUROHIS-QOL 8-item, and BPNSFS. By choosing to participate, study participants agreed to the informed consent. In the informed consent, I assured participants confidentiality of their answers. Participants were deidentified to ensure the confidentiality of participants. The collected data was stored on a password-protected computer within a locked room.

The survey took less than twenty minutes for participants to complete. In classes where I could meet with potential participants face-to-face, some instructors allotted time in the class for participants to complete the survey. Students I recruited via email were sent two reminder emails every three weeks to remind them to complete the survey and to help increase the participation response rate. Participants had the opportunity to be included in a raffle for one of the eight \$50 Amazon gift cards. Incentivizing students to participate upon survey completion could have increased response rates (Gall et al., 2007).

Data Analysis

The independent variable for this study was whether participants were currently enrolled in a physical activity course. Demographic questions measured this variable. Additionally, I created a dummy code variable (0, 1), assigning the participant groups to help indicate group membership. The dependent variables were the participant's wellness (K10), psychological distress (EUROHIS-QOL 8-item), and basic psychological needs (BPNSFS) scores.

Upon receiving the completed surveys, I collected, cleaned, and analyzed the data. I identified why the data was missing to determine the potential impact of missing data on the study. Missing data usually fall into the following categories, missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR). MCAR data means that there is no difference between what is missing and what was observed. The data collected is a random subset of the data. Contrarily, MAR data is the opposite of MCAR, in which the cause of the missingness has nothing to do with the missing data but is related to the observed data of other variables. The missingness can be predicted based on other information that is collected. Meanwhile, MNAR is related to events or factors not measured by the researcher.

According to Rovai et al. (2013), missing data can reduce the sample size and the statistical power. To determine whether data is missing, I ran a descriptive analysis in SPSS to find the percentage of missing values for each variable. Examining the data and using the Missing Value Analysis procedure in SPSS allowed me to determine the nature of the missing data. After examining the missing data, I used the exclude pairwise case approach in SPSS. This approach allowed me to omit missing data cases amongst all variables to analyze the rest of the data. The parameter estimated will be less biased if the assumption is that the data are missing at random. After assessing for missing data, I checked for any errors in the data and corrected any that needed to be.

Further, I checked the individual participants' raw scores against the scoring procedures of the EUROHIS-QOL 8-item, K10, and BPNSS. For the Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2015), I will need to reverse the score for the following questions: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, and 22. The preliminary and primary analysis will take place once the changes are made.

Preliminary Analysis

Before analyzing data based on my research questions, I conducted a preliminary analysis of the data to check assumptions for normality, the presence of outliers, normality, linearity, homoscedasticity, and multicollinearity of variables. Also, I completed descriptive statistics to describe the baseline characteristics of the sample. Descriptive statistics in SPSS provided a summary of the means, median, and standard deviation statistics. To determine equivalence, I examined the p-value thresholds of the groups by completing a t-test to compare group means using the student's demographics. The preliminary analysis also tested for correlations in the demographic data to test for covariates.

Assumptions. According to Pallant (2020), the following assumptions need to be made before testing the analysis in this study:

1. Sample Size: There need to be more cases in each cell than you have dependent variables. A larger sample will help with getting away with violations of some of the other assumptions.
2. Normality: The distribution of scores on the dependent variable should be normal.
3. Outliers: I need to check for Univariate and Multivariate outliers. Some cases may need to be deleted if there are too many outliers or extreme scores, or the variable involved needs to be transformed.
4. Linearity: There needs to be a straight-line relationship between each pair of the dependent variables.
5. Homogeneity of regression: This assumption is essential for performing a step-down analysis.

6. Multicollinearity and Singularity: MANOVA will work best when the dependent variables are moderately correlated. Low correlations may cause the need to run a separate univariate analysis of variance for your various dependent variables. Multicollinearity is when the dependent variables are highly correlated. Singularity is when one of the variables is a combination of other variables. It can be avoided by knowing what the variables are and how the scores are obtained.

7. Homogeneity of variance-covariance matrices: Multiple groups may have the same covariance matrix.

Primary Analysis

I used a multivariate analysis of variance (MANOVA) to determine whether there were statistically significant differences between participants enrolled in physical activity courses versus those not concerning their scores on overall wellness, psychological distress, and basic psychological needs. A MANOVA helps protect against a Type I error due to conducting multiple ANOVAs. If the preliminary analysis identified correlations and covariates from the demographic data, a multivariate analysis of covariance (MANCOVA) would have been used to control for the covariates. Chartier and Allaire (2007) stated that when multiple univariate tests are used, estimation of the type I error inflation is difficult since the multiple tests are not independents. They also said that while univariate tests ignore the correlations among the variables, multivariate tests tend to be more powerful than multiple univariate tests. The Statistical Package for Social Sciences (SPSS), version 27.0, was used for all data analyses.

Summary

Using a quantitative research design, my study intended to examine the relationship between physical activity courses and college students' psychological

distress, overall wellness, and psychological need satisfaction. The sample collected included individuals at the college level who have and have not taken physical activity courses. Participants completed a survey that was analyzed using descriptive and inferential statistics to examine physical activity engagement on college students' overall wellness, psychological distress, and basic psychological needs satisfaction.

CHAPTER 4

RESULTS

Chapter Four provides the present study's findings, addressing the research questions and the analysis for each question. I investigated whether college students' engagement in physical activity courses impacted their basic psychological needs, overall wellness, and psychological distress symptoms. Chen and colleagues (2015) Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS) was used to measure their basic psychological needs. I examined the variable of psychological distress using the Kessler Psychological Distress (K10) (Kessler et al., 2002), while using the EUROHIS-QOL (Schmidt et al., 2006) to examine the variable of wellness.

This study utilized a cross-sectional, casual comparative design survey to examine the differences between college physical activity courses on students' basic psychological needs, wellness, and psychological distress. Descriptive and inferential analysis were used to describe and explain the data collected.

Population and Sample

The population for this study were adults over 18 years of age who were undergraduate college students attending a United States post-secondary institution in South Carolina. The institution offered a physical activity or health-related fitness program for course credit that individuals could take towards their degree. I recruited participants through convenience sampling. Recruitment consisted of emailing and attending classes for students currently enrolled in physical activity courses at the College

of Hospitality, Retail, and Sport Management, the Arnold School of Public Health, the Psychology department, and the College of Education. Eligible participants who received the survey link via email were provided a reminder email every three weeks to encourage them to participate. Recruitment took place over eight weeks of the Fall 2022 semester. I distributed over 2,500 survey links to eligible participants, with 394 potential participants responding to determine eligibility. This yielded a 15.7% response rate. The potential participants who met the research criteria were 192 undergraduate students who completed the survey. Study participants received the survey either through an email link or on the distributed flyers.

Data collection consisted of eight weeks beginning in early October and ending in December during the last semester of the Fall 2022 semester. Potential participants who previously took PA courses and are currently taking more than one PA course or are required to take PA courses to complete their degree were ineligible to participate. After determining eligibility through the Qualtrics link, interested eligible participants completed the survey. The survey included the consent form, demographics form, K10, EUROHIS-QOL 8-item, and BPNSFS. Participants who completed the study were eligible to be entered into a raffle for one of eight \$50 Amazon gift cards. Raffle winners received gift cards after study completion.

Participants Demographics

Presented are descriptive data for all study participants. Frequency tables were utilized for analyzing the demographic variables. The following demographic variables are reported on the sample ($N = 192$; see Table 4.1).

Most of the participants identified as female ($n = 162$, 85.7%) over males ($n = 25$, 13.0%). A small minority of participants identified as non-binary ($n = 2$, 1.0%). The majority of participants' ages ranged from 18-24 ($n = 188$, 97.9%). Ethnicity among participants was reported as 153 Caucasian (80.5%), 11 Hispanic (5.8%), 10 Black/African American (5.3%), 7 Multiracial (3.7%), 2 Hawaiian/Pacific Islander (1.0%) and 7 Preferred not to disclose (3.7%). The ethnicity of participants was representative of the greater university campus. Undergraduate enrollment figures obtained from the university revealed a campus population that was 76.7% Caucasian/White, 10.2% African American, 0.2% Native American, 2.3% Asian, 4.0% Hispanic, 0.1% Pacific Islander, 3.2% Multiracial, 1.6% Non-resident Alien, and 1.7% No Response.

Respondents included 88 Seniors (46.3%), 46 Juniors (24.2%), 41 Sophomores (21.6%), and 15 Freshmen (7.8%). Five (2.6%) participants identified as either a graduate student or other, and their data was subsequently removed from the analysis.

Of the 192 participants, 189 identified the college/school where they earned their degree. Most participants were receiving their degree within the College of Arts and Sciences ($n = 76$, 40.2%); followed by the School of Public Health ($n = 46$, 24.3%); and the College of Hospitality, Retail, and Sport Management ($n = 17$, 9.0%). These other colleges were represented among participants as well, College of Education ($n = 12$, 6.3%), College of Nursing ($n = 7$, 3.7%), Honors College ($n = 12$, 6.3%), School of Business ($n = 8$, 4.2%), College of Engineering and Computing ($n = 7$, 3.7%), College of Information and Communications ($n = 2$, 1.0%), and the College Pharmacy ($n = 2$, 1.0%).

Table 4.1 Participant Demographic Variables*

Demographic	Total (n)*	Percentage
Gender		
Female	162	85.7%
Male	25	13%
Non-Binary	2	1%
Age		
18 - 24	188	97.9%
45 - 54	1	0.5%
65 - 74	1	0.5%
Race		
White	153	79.6%
Native Hawaiian or Other Pacific Islander	2	1%
Black or African American	10	5.2%
Hispanic Latino or Spanish origin	11	5.7%
Multiracial	7	3.7%
Prefer not to disclose	7	3.7%
Classification Year		
Freshman	15	7.8%
Sophomore	41	21.3%
Junior	46	23.9%
Senior	83	43.2%
Graduate	2	1%
Other	3	1.5%
College/Major		
College of Arts and Sciences	76	39.5%
College of Education	12	6.2%
College of Hospitality, Retail, and Sport Management	17	8.8%
College of Nursing	7	3.6%
School of Public Health	46	23.9%
Honors College	12	6.2%
School of Business	8	4.1%
College of Engineering and Computing	7	3.6%
College of Information and Communications	2	1%
College of Pharmacy	2	1%

Note. *This table is representative of $n = 192$.

The 192 participants comprised two groups, currently enrolled students in

physical activity groups ($n = 94$, 48.9%) and students not enrolled in courses ($n = 98$, 51.0%) (See table 4.2). For participants in the physical activity group, most were enrolled in beginner power and nontraditional yoga and Pilates ($n = 27$, 28.7%), followed by outdoor sports ($n = 15$, 16.0%) and courses that were not listed under a category ($n = 15$, 14.9%). In the courses not listed under a category, marching band had the most participants ($n = 3$). The other course categories included self-defense ($n = 7$, 7.4%), weight training ($n = 3$, 3.2%), cardio ($n = 5$, 5.3%), hybrid classes ($n = 1$, 1.0%), dance ($n = 4$, 4.3%), water activities ($n = 5$, 5.3%), outdoor activities ($n = 5$, 5.3%), and indoor sports ($n = 7$, 7.4%).

Table 4.2 Group Participation

Group Participation	Total (n)	Percentage
PA Course Participation	94	48.9%
No PA Course Participation	98	51.0%

Table 4.3 Type of PA Course

Type of PA Course	Total (n)	Percentage
Beginning, Power & Non-Traditional Yoga & Pilates	27	28.7%
Self-defense	7	7.4%
Weight training (Beginning, Advanced, Strength Training for Women)	3	3.1%
Cardio/Conditioning activities (ROTC, Jogging, Personal Fitness/Training, Triathlon, Group Exercise, Weight Control)	5	5.3%
Outdoor sports (Quidditch, Golf, Tennis, Soccer, Softball)	15	15.9%

Hybrid class (More than one activity/sport)	2	2.1%
Dance (Zumba, Latin, Swing, Shag, Belly, Beginning, and Intermediate Social Dance, African)	4	4.2%
Water activities (Scuba, Sailing, Kayaking, Canoeing, Beginning & Intermediate swimming, Paddleboarding, Lifeguard Training)	5	5.3%
Outdoor activities (Rock Climbing, Backpacking, Archery, Equestrian, Flying Disc, Snow Skiing, Geocaching, Skateboarding)	5	5.3%
Indoor sports (Bowling, Basketball, Volleyball, Fencing & Intermediate Fencing, Badminton, Racquetball, Karate & Intermediate Karate)	7	7.4%
Not Listed	15	15.9%

Table 4.4 College/School by Group Participation

	PA Course Participation	No Course Participation	Total
College/School			
College of Arts and Sciences	23	53	76
College of Education	0	12	12
College of Hospitality, Retail, and Sport Management	5	12	17
College of Nursing	6	1	7
School of Public Health	29	17	46

Honors College	9	3	12
School of Business	8	0	8
College of Engineering and Computing	7	0	7
College of Information and Communications	2	0	2
College of Pharmacy	2	0	2
Total	91	98	189

Note: (*This table is representative of $n = 189$)

There was a question regarding whether participants received mental health services while attending college. Of the 174 participants, more participants in the group not currently enrolled in PA courses have received mental health services (18.9%) than those in the PA course group (16.0%). However, mental health services were not statistically significant on any outcome variables.

Table 4.5 Mental Health Services*

	Yes	Percentage	No	Percentage
Group Participation				
PA Course	28	16.0%	62	35.6%
Participation				
No PA Course	33	18.9%	51	29.3%
Participation				
Total	61	34.9%	113	64.9%

Note. *This table is representative of $n = 174$

Data Cleaning

Cleaning the data began with checking for exclusionary criteria. Three hundred ninety-four individuals responded to the survey, 202 were currently enrolled in PA courses, and 192 had never taken a PA course; how individuals responded to the opening question determined whether they would be eligible for the PA course group or the no PA course group. Individuals who shared that they are taking more than one PA course or/and required for their degree were excluded from the PA course group data. Individuals who identified they are currently not enrolled in any PA course but identified with taking previous PA courses and/or are required to take PA courses for their degree were removed from the no PA course group data. After placing the exclusionary criteria, this left 94 participants in the PA group course and 98 participants in the No PA group course. Based on an *a priori* power analysis, the target sample for this study was 180 participants. Thus, the sample of 192 should yield sufficient power for the intended analyses.

The independent variable was labeled with a dummy code (0 = PA course group, 1 = No PA course group). Missing data were examined using the frequencies and the missing data analysis in SPSS. The analysis identified that six participants had data missing from the psychological distress variable, 17 for the wellness variable, and 15 for the basic psychological needs variable. Therefore, after examining the missing data, a total of 172 participants were used for analysis. According to the missing data analysis of Little's MCAR test, the data appears to be missing at random. Therefore, in performing a MANOVA with SPSS, listwise deletion of cases is the only option. Listwise deletion of cases

means that all the cases in this study that had valid data on all the variables were used for analysis (IBM Corp, 2020). Therefore, each variable had a sample of $n = 172$.

Before further analysis could be completed, reverse scoring for the Basic Psychological Need Satisfaction and Frustration Scale needed was required on the following questions: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, and 22. The preliminary and primary analysis took place after the completion of the changes.

Research Hypothesis and Analysis

The Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2015), Kessler Psychological Distress (K-10; Kessler et al., 2002), and the EUROHIS-QOL (Schmidt et al., 2006) were utilized to analyze the variables in the current study.

Each assessment used in the present study was analyzed for reliability using Cronbach's alpha to determine the assessment's consistency with producing reliable results under similar circumstances. The alpha reliability for each scale was BPNSFS at $\alpha = .73$, K-10 at $\alpha = .89$, and EUROHIS-QOL at $\alpha = .80$. A range of scores at or greater than .70 is considered respectable. It estimates internal consistency between items on the scale (DeVellis, 2012, as cited in Johnson & Morgan, 2016).

A total score for each scale was collected for data analysis.

The research questions and hypothesis posed were as follows:

1. Do college students enrolled in university-based PA courses report higher levels of basic psychological needs satisfaction compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report higher

levels of basic psychological needs compared to students who have never taken a university-based PA course.

2. Do college students enrolled in university-based PA courses report higher levels of wellness compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report higher levels of wellness compared to students who have never taken a university-based PA course.

3. Do college students enrolled in university-based PA courses report lower levels of psychological distress compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report lower levels of psychological distress compared to students who have never taken a university-based PA course.

Preliminary Analysis

Preliminary assumption testing was conducted to check for normality, linearity, outliers, homogeneity of variance-covariance matrices, multicollinearity, and multivariate normality.

When completing a check for multivariate normality, four outliers were identified while calculating the Mahalanobis distance. The outliers were removed from the data to reduce their influence on the analysis (Tabachnick & Fidell, 2021). Once the identified outliers were removed, the preliminary assumption testing continued and was examined with no serious violations noted. All the assumptions were met.

Analysis

A one-way between-groups multivariate analysis of variance (MANOVA) was performed to investigate between-group differences in college students' PA course participation and their basic psychological needs satisfaction (as measured by BPNSFS), psychological distress (as measured by K10), and wellness (as measured by EUROHIS-QO) and to limit type one error. The independent variable was PA course participation with two levels: PA course participation and No PA course participation. Further, three dependent variables were used: basic psychological needs satisfaction, psychological distress, and wellness. All the dependent variables were created as continuous variables.

The multivariate test was significant, $F = 4.208$, Wilks' Lambda = .93, $p = .007$ (see Table 4.6). This significance warranted further exploration through univariate testing.

Table 4.6 Multivariate Tests (Wilks' Lambda) Differences Between PA Course Participation and No PA Course Participation With Basic Psychological Needs, Psychological Distress, and Wellness

		Value	F	Hypothesis (df)	Error (df)	Sig.	Partial Eta (Sq.)
Group Participation	Wilks' Lambda	.930	4.208	3.000	168.000	.007	.070

Notes: * $p < .05$

Univariate, post hoc, analysis revealed that the dependent variables, basic psychological needs (sig. = .162), psychological distress (sig. = .123), and wellness (sig. = .470), were not significantly different between PA course participation and no PA course participation (see Table 4.7). This indicates that the independent variable of course participation does not yield a statistical difference as it relates to one's basic

psychological needs satisfaction, psychological distress, or wellness. An inspection of the mean scores indicated that college students not enrolled in PA courses reported slightly lower levels of psychological distress ($M = 36.09$, $SD = 7.06$) than currently enrolled students ($M = 37.78$, $SD = 7.215$ (see Table 4.8). While college students enrolled in PA courses reported slightly higher levels of basic psychological needs ($M = 58.43$, $SD = 9.130$) than none enrolled students ($M = 56.57$, $SD = 8.132$).

Table 4.7 Univariate Analysis of Variance Between PA Course Participation and no PA Course Participation With Basic Psychological Needs, Psychological Distress, and Wellness

	<i>Sum Square</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>Sig.</i>
Basic psychological needs satisfaction	148.467	1	148.467	1.976	.162
Psychological distress	122.897	1	122.897	2.408	.123
Wellness	12.896	1	12.896	.523	.470

Notes: $p < .05$

Table 4.8 Descriptive Statistics for Differences Between Basic Psychological Needs Satisfaction and Psychological Distress and Wellness

	<i>M</i>	<i>SD</i>	<i>n</i>
Total Basic Psychological Satisfaction Score			
PA Course Participation	58.43	9.130	90
No PA Course Participation	56.57	8.132	82
Total			172

Total Psychological Distress Score			
PA Course Participation	37.78	7.215	90
No PA Course Participation	36.09	7.066	82
Total			172
Total Wellness Score			
PA Course Participation	30.76	4.984	90
No PA Course Participation	30.21	4.943	82
Total			172

Hypothesis One

Hypothesis One stated that college students enrolled in university-based PA courses would report higher levels of basic psychological needs compared to students who have never taken a university-based PA course. Further, the tests of between-subject effects examined the differences between the two variables and were not significant ($p = .162$). This finding suggests no significant differences between PA course participation and basic psychological needs among college students.

Hypothesis Two

Hypothesis Two stated that college students enrolled in university-based PA courses would report higher levels of wellness than students who have never taken a university-based PA course. The tests of between-subject effects examined the differences between the two variables and were not found significant ($p = .470$, see Table 4.7). This finding suggests no significant differences between PA course participation and wellness among college students.

Hypothesis Three

Hypothesis One stated that college students enrolled in university-based PA

courses would report lower levels of psychological distress than students who have never taken a university-based PA course. The tests of between-subject effects examined the differences between the two variables and were not found significant ($p = .123$, See Table 4.7). This finding suggests no significant differences between PA course participation and psychological distress among college students.

Summary

Chapter 4 presented the results of the data analyses utilized for this study. A one-way between-groups MANOVA was conducted to examine the differences between the independent and dependent variables. No significant differences were found for the three dependent variables. Chapter 5 discusses the results, implications for counselors and counselor educators, and future research.

CHAPTER 5

DISCUSSION

In chapter 5, I provided a review of the study's purpose, research methodology, and results. I also included a discussion of the findings presented from the results of chapter four. In addition, the chapter concludes with a discussion of (a) study limitations, (b) implications for counselor education and professional counselors, and (c) areas of future research.

Overview of the Study

The current study explored the differences between physical activity (PA) course participation and college students' wellness, psychological distress, and basic psychological need satisfaction. Increasing insight into understanding the differences in PA course participation among college students could lead to implications for improving college students' mental health and wellness. Increasingly, researchers have begun exploring the effects of physical activity on college students' mental health and wellness; however, there is a need for more literature regarding physical activity course participation. Therefore, the current investigation assessed college students' psychological distress (as measured by *Kessler Psychological Distress* [K10], Kessler et al., 2002), wellness (as measured by *EUROHIS-QOL*, Schmidt et al., 2006), and basic psychological needs satisfaction (as measured by *Basic Psychological Need Satisfaction and Frustration Scale*, [BPNSFS], Chen et al., 2015) on their physical activity course participation. Therefore, this study tested the hypothesized differences that PA course

participation will exhibit lower psychological distress, higher wellness, and higher basic psychological need satisfaction than those who do not.

For the current study, a one-way between-groups MANOVA was conducted to examine the differences between physical activity course participation and college students' psychological distress, basic psychological needs, and overall wellness. In reviewing the results from the MANOVA, none of the hypotheses were supported.

Discussion

The results of this study, presented in Chapter four, are further discussed below within the context of the previously reviewed literature discussed in Chapter Two.

Research Question One

1. Do college students enrolled in university-based PA courses report higher levels of basic psychological needs satisfaction compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report higher levels of basic psychological needs compared to students who have never taken a university-based PA course.

The first hypothesis focused on college students' PA course participation and basic psychological need satisfaction. According to Ryan and Deci (2000b), when our psychological needs are unmet, it can lead to anxiety, grief, hostility, and other negative emotions. The results for research question one indicated no significant effects on basic psychological needs satisfaction between those enrolled in PA and those who were not. Therefore, this investigation fails to reject the null hypothesis. Though the findings were identified as non-significant, examining the means of course participation and basic

psychological needs satisfaction shows that students enrolled in PA courses reported a slightly higher score ($M = 58.43$) than non-enrolled students ($M = 56.57$). However, the difference is well below one standard deviation from the mean. Course participation may influence students' basic psychological need satisfaction, which could be detected with a larger sample size. According to self-determination theory, if people's basic psychological needs are met, they are motivated to engage in physical activities that will lead them to growth and well-being. For the current study, students required to take a PA course were not eligible for this study. If participants enrolled in PA courses for their growth and well-being, it would be understandable why they would report a higher score (Deci & Ryan, 2000; Ryan & Deci, 2002; Zhang et al., 2012). This is like the investigation by Kim and Cardinal (2017), who reported that university students enrolled in PA courses for the following reasons: wanting to improve their fitness levels, obtain regular exercise, have fun, learn a new activity, and reduce their stress level.

However, this study cannot say whether self-determination theory can explain students' basic psychological needs satisfaction. Though the data showed the PA course group had a higher mean score, I cannot assume these students are satisfied with their basic psychological needs compared to the other group. Therefore, we cannot know if physical activity course participation led to better overall well-being and growth. Also, participants may be engaging in other activities that would be counterproductive to the work leading them to achieve their optimal growth and well-being (Van den Broeck et al., 2016). For example, students who are not consistently engaging in their studies, are involved in risky behaviors, or do not feel connected to the university community may be at risk (Horton, 2015).

In addition, there are cultural factors that may have contributed to the non-

significant results. Ryan and Deci (2000b) considered cultural values and behaviors when determining psychological need satisfaction. The students' background culture may have impacted how they interpreted and responded to the questions. For example, if students did not grow up in a loving or supportive environment, they may answer support questions differently than students who did (Ryan & Deci, 2000b).

Another possible explanation for the current study's findings is that basic psychological needs are not considered interchangeable and cannot compensate for one another. Therefore, if a person does not feel whole with their needs, the other two needs cannot offset it. For example, if a student in a PA course felt their autonomy and relatedness needs were met but not their competence needs, the other two needs would not be able to fulfill the lacking need. However, according to Ryan and Deci (2000b), conflict among needs is okay and usually happens due to social conflicts, such as college students having issues with peers or family members.

When using the measures of Deci et al. (2001) and Van den Broeck et al. (2010), Van den Broeck et al. (2016) propose not combining the three basic needs scales into one overall scale because the need for competence would sometimes predict outcomes in the opposite direction of autonomy and relatedness. In examining the combination of scales, the researchers looked to work studies, which is different from the interest area of my current study. However, the authors noted the importance of combining needs into an overall scale due to the high correlations of the scales and analysis used in the studies they explored. On the other hand, the current study used a different measure than the one examined in the literature. The creators of the BPNSFS suggested combining subscales to create an overall scale for the measure. Although an overall scale was established, it is undetermined whether combining the scales impacted the results.

Research Question Two

2. Do college students enrolled in university-based PA courses report higher levels of wellness compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report higher levels of wellness compared to students who have never taken a university-based PA course.

The current study explored the group differences in wellness because colleges focus on students' overall wellness and the need to thrive (LaFontaine et al., 2006). In correlation to the previous variable, when someone's need is unmet, it can impact their wellness (Ryan & Deci, 2000). However, this hypothesis was not supported in the current study. In examining the means of course participation and wellness, the PA course participation group ($M = 30.76$) reported slightly higher levels of wellness than non-course participants ($M = 30.21$). However, the mean difference is below the standard deviation ($SD = 4.9$). What is surprising about this finding is that both groups reported higher levels of quality of life (30 out of 40) based on the total score of the scale (EUROHIS-QOL) measuring wellness. In the literature, students who were engaged and participated in physical activity or PA courses exhibited higher levels of wellness compared to their peers who were not (Joseph et al., 2014; Lothes, 2020; Marinaro, 2019; Sidman et al., 2009).

The literature regarding physical activity and overall wellness among college students needs to be more extensive, especially in examining the effects of specific interventions. Milroy and colleagues (2013) reported that students enrolled in online and hybrid fitness courses had higher perceived wellness than those enrolled in a face-to-face

format. The current study did not explore the PA course group format. Therefore, I cannot determine the higher levels of wellness as a contributing factor. However, it is essential to understand how this could be a possible explanation among the PA course group. Depending on the instructional activities provided during different delivery formats may influence how students identify their wellness.

Another possible explanation, especially among the PA course group, is that participation in the course, despite delivery, can improve students' wellness (Lothes, 2020; Marinaro, 2019). While in these courses, students could be learning items related to wellness concepts; this is aligned with the research done by Adams et al. (2006), who identified that PA courses might be the only introduction college students have to health, wellness, and PA in general. Suppose instructors know PA courses are the only introduction students may get to wellness. In that case, they may emphasize providing students with instructional activities that would allow them to increase their knowledge about it. Therefore, encouraging students to engage in activities could contribute to high levels of wellness.

Depending on the major of students in the no PA course group, we cannot determine if they are also receiving learning around wellness-related concepts. Most participants in the no-course participation group are from the colleges/schools of Arts and Sciences, Education, Public Health, Hospitality, Retail, and Sport Management, while participants in the PA course are from over nine colleges/schools. Baldwin and colleagues (2017) examined college students' wellness based on the type of institution. They identified how liberal arts college students were more physically active and endorsed more overall health behaviors than those attending a research university. Most of the non-PA course group respondents identified colleges/schools that would be offered

at a liberal arts institution. In comparison, the PA course group consisted of colleges/schools known at a research university. At liberal arts institutions, there is a focus on active learning, respect for diversity, and student-faculty connection, whereas research universities emphasize discovering and disseminating research. The institution where the study took place is a research institution; how students receive the information they learned in their college/schools could impact how students perceive their wellness. Further research is needed to understand how college students' studies can impact how they perceive their overall wellness.

Research Question Three

3. Do college students enrolled in university-based PA courses report lower levels of psychological distress compared to students who have never taken a university-based PA course?

H_{a1} : College students enrolled in university-based PA courses will not report lower levels of psychological distress compared to students who have never taken a university-based PA course.

I observed differences between PA course participation and psychological distress levels for the final hypothesis. The tests of between-subject effects examined the differences between the two variables and were not found significant ($p = .123$). The findings suggest no significant differences between PA course participation and psychological distress among college students. However, when examining the mean scores of psychological distress and course participation, students not enrolled in PA courses ($M = 36.09$) reported lower levels of psychological distress than currently enrolled students ($M = 37.78$). However, it is important to note that both groups' total

score is identified in the high range (22-50) scale (K-10) measured for psychological distress. Therefore, despite group membership, students are presenting as distressed. The results are consistent with findings examining psychological distress among college students compared to the general population (Sharp & Theiler, 2018; Stallman, 2010). College students are reporting higher levels of mood disturbances (e.g., depression and anxiety) and other life adjustments that are impacting them. Furthermore, whether these factors contributed to the high psychological distress reported by participants in the current study is undetermined.

Additionally, this finding is noteworthy, especially for the PA course participation group. Previous research identified that post-secondary students who were active despite physical activity levels reported lower psychological distress, more positive moods, and reduced risk of hopelessness, depression, and suicidal behavior compared to inactive or lower sedentary students (Bray & Born, 2004; Dogra et al., 2018; Lee & Kim, 2019; Sheikh et al., 2018; Taliaferro et al., 2009; Tyson et al., 2010; Uddin et al., 2020). However, other contributing factors may impact participants in this group to report lower levels of psychological distress. For example, if students are having trouble with their mental health, this could have inverse effects on physical activity (Faulkner & Carless, 2006; Lando et al., 2006; O'Loughlin et al., 2013), causing them to have limited engagement or not to engage in the activity at all. Unfortunately, this study did not determine whether this is a factor.

Moreover, when examining participation in mental health services, 18.9 % of participants in the no-course participation group received services in comparison to 16.0% of the course participation group. Though mental health services were non-significant on the outcome variables, this data is still something to consider when

exploring the data. The percentage of participants (34.9%) who utilized mental health services was consistent with previous research examining mental health utilization by college students over 10 years (Lipson et al., 2018). Based on the data, we know students are choosing to engage in services; however, the data does not tell us how long students were using services and the severity of their mental health. If students are already experiencing higher levels of psychological distress before or during treatment, it is understandable why they report high levels of distress. However, this study did not examine contributing factors to students' psychological distress. Further research is needed to explore the impact of mental health services on college students' psychological distress.

The current findings support the idea that psychological distress is high among college students. However, we cannot determine whether physical activity influences lowering levels of psychological distress. There might be other considerations that need to be further investigated.

Limitations

Although attempts were made, the current study has limitations that must be considered. First, attempts to limit threats to validity were made; however, not all threats could be eliminated. A casual comparative design does not include random assignment and does not involve manipulating the independent variables. Therefore, the results are only generalizable to some university students. The lack of randomization prevented controlling for extraneous and confounding variables such as group participation, college/school where students obtain their degree, and the type of PA courses.

Additionally, a significant sampling limitation of this study was that all participants attended one university in the southeastern part of the United States.

Surveying one university limits the ability to gain perspectives from college students attending other universities. Therefore, the data cannot be generalized to the larger population of college students in the United States. Finally, a potential confounding variable that may have impacted the outcome of this study included participants answering questions that may have affected their mental health status. I also asked sample participants if they received mental health services. Therefore, to help with the aftereffects of testing, I provided participants with resources to access mental health services.

In addition, whether the learning material impacted how participants answered questions is unknown. Some sample participants took courses in counselor education, psychology, or public health, which could have affected how participants answered the questions. In helping to eliminate the possibility of a carry-over effect from physical activity courses, individuals who previously took PA courses were excluded from the study. Also, the measures used in this study were administered over multiple weeks of the semester. Depending on what part of the semester students were administered the survey could have impacted how they interpreted and responded to the questions.

Another potential limitation to internal and external validity threats includes participants' self-reporting on scale instruments. Contributing factors that may have affected their self-report accuracy included their physical environment, understanding of the instructions to complete the survey, and even how they felt emotionally or physically when taking the survey. Additionally, sample participants had the opportunity to learn about the study during recruitment, potentially leading to social desirability and answering self-report measures how they believed the researcher wanted them to respond.

I did not collect baseline data on sample participants. Therefore, it is unknown

whether students enrolled in PA courses already exhibited a higher wellness level than those not enrolled. Not having baseline data makes it difficult to know whether there are differences between course participation. Unfortunately, this study did not control for participants' physical activity levels or PA outside of coursework. According to the research, students engaged in more physical activity outside of the PA course or their regular courses tend to report positive moods and wellness (Bray & Born, 2004; Tyson et al., 2010; Uddin et al., 2020). The results could have been impacted if participants engaged in outside physical activity.

Another limitation of this study was that data was not included in the analysis due to the listwise deletion of cases. Eliminating data through listwise deletion impacts the sample size but can also introduce biases in estimating the parameters (Kang, 2013; Pallant, 2020). Using the default option among SPSS could have resulted in excluding cases that could have impacted the results of the data, therefore, establishing biases.

Implications

The present study intended to determine the differences among PA course participation on college students' basic psychological needs, satisfaction, wellness, and psychological distress. Unfortunately, research on physical activity course participation and college students' mental health and overall wellness is limited. Therefore, this study analyzed data examining the differences between college students' physical activity course participation to infer their overall wellness, basic psychological needs satisfaction, and psychological distress. Although the non-significance of this study results among course participation on college students' overall wellness, psychological distress, and basic psychological needs, there are implications for counselor educators, practitioners, and college administrators.

Previous researchers have stated seeing an increase in college students' experiencing and reporting higher distress, depression, and anxiety over the years (Prince, 2015; Watkins et al., 2012) which has exacerbated even more since the COVID-19 pandemic (Lederer et al., 2021; Liu et al., 2020). As a result, college campuses and administrators are identifying how to support the growing number of students who need mental health services (Douce & Keeling, 2014; Kitzrow, 2003; Watkins et al., 2012). The current study attempted to identify a potentially valuable resource supporting students seeking mental health services. Counselors and college administrators can utilize the results of this study to suggest enrollment into a physical activity course to help with mental health symptoms and overall well-being. Though there were no significant differences between groups regarding the findings, the physical activity group participants exhibited higher basic psychological needs and wellness scores.

Another implication is examining physical activity course benefits at the collegiate level. Physical activity and physical activity interventions have been proven to improve adults' overall quality of life (Mammen & Faulkner, 2013; Zschucke et al., 2013). This study adds to the literature exploring the differences between course participation and students' wellness, basic psychological needs, and psychological distress to help plan future interventions. Understanding the differences allows college/university faculty and staff to examine the curriculum and develop physical activity courses that impact students and their collegiate experience. The current study provides support for physical activity promotion. It allows students to learn more about physical activity and how to integrate it into their everyday lifestyle.

The findings in this study identified high wellness scores among all participants despite group participation. This information is beneficial to counselor educators,

counselors, and college administrators. For counselor educators, emphasizing wellness within the counselor-in-training curriculum will allow counselors-in-training to discuss and implement wellness for themselves (Yager & Tovar-Blank, 2007). At the same time, college administrators can use the findings to incorporate wellness into their student's curriculum needs. The benefits of incorporating wellness courses for students include improving their quality of life and gaining a community amongst their peers (Higgins et al., 2009).

Further Research

Though the current study's findings focused on the differences between college students and PA course participation, a further researcher could contribute to this topic. As stated in the limitation section, this study did not have sample participants complete baseline data. An investigation could examine participants' baseline data among the variables to determine whether PA course participation makes a difference throughout a semester. Additionally, this information could lead to an intervention study using PA courses. Researchers may also want to build upon this study by examining physical activity levels among the groups to determine whether outside-of-course participation could impact overall wellness, psychological distress, and basic psychological needs.

Another study could examine college students' basic psychological needs satisfaction, and frustration. Need frustration has been identified as a better predictor of negative outcomes, such as burnout, depression, and sedentary time (Li et al., 2021, as cited by Bartholomew et al., 2011; Vansteenkiste et al., 2020; Warburton et al., 2020), therefore, understanding of the need frustration with PA course participation.

More research is needed to understand how physical activity courses can benefit college counseling and wellness centers. Future studies could build upon this study by

collaborating with these entities to identify how PA course participation impacts their students. This may also lead to future research exploring interventions that utilize PA courses and wellness education to help improve college students' overall mental health and well-being. Researchers may also want to investigate how students' mental health symptoms could impact their involvement with physical activity.

The current study noticed that participation in this study exhibited high wellness scores. Future studies could examine the relationship between holistic wellness and PA course participation to determine whether it would be a predictor of psychological distress.

Though this study did not focus on the motivational factors of course participation, future research is needed to examine how intrinsic and extrinsic motivation of PA course participation could impact college students' overall wellness, basic psychological needs, and well-being. Moreover, analyzing motivational factors could help to understand why some students may engage in physical activity more than others.

Conclusion

This study aimed to examine the influence of physical activity courses on college students' overall wellness, psychological distress symptoms, and basic psychological needs. However, the results of this study did not support any of the hypotheses. Therefore, further examination and future studies will need to expand upon the results of this study to understand college students' physical activity participation on their overall wellness, psychological distress symptoms, and basic psychological needs.

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APPENDIX A

INFORMED CONSENT

This research is being conducted by Genée' Renee Glascoe, a Ph.D. candidate in Counselor Education and Supervision at the University of South Carolina, under the guidance of Dr. Ryan Carlson.

This research examines factors related to college students' mental health and physical activity. The purpose of this research is to examine differences in college students' overall wellness, psychological distress, and basic psychological need with relation to physical activity engagement.

You are being asked to complete this survey because you are over the age of 18 and currently attending a university that has a physical activity or health-related fitness program to earn course credit towards their bachelor's degree. Participation in this research is completely voluntary, and you have the right to withdraw or discontinue participation at any time. Data will be kept confidential and encrypted. All personal information will be deleted after the data analysis is completed. This survey includes demographic questions and three other sections of questions. It should take less than 20 minutes to complete this survey. Upon the completion of the survey, you will be eligible to enter a contact email address for a chance to win one of eight \$50 Amazon gift cards.

If you have questions or concerns about this research, please contact Genée' Glascoe at gglascoe@email.sc.edu, or Dr. Ryan Carlson, at rcarlson@sc.edu.

APPENDIX B

EUROHIS SCALE

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Chapter 10. Development of a common instrument for quality of life

Appendix 10.1

EUROHIS recommended common instrument for quality of life (field-tested in 2001)

Interviewer. This set of questions asks how you feel about your quality of life, health or other areas of your life. We ask that you think about your life in the past two weeks.

1. How would you rate your quality of life:

very poor,
poor,
neither poor nor good,
good, or
very good?

2. How satisfied are you with your health:

very dissatisfied,
dissatisfied,
neither satisfied nor dissatisfied,
satisfied, or
very satisfied?

3. Do you have enough energy for everyday life:

not at all,
a little,
moderately,
mostly, or
completely?

4. How satisfied are you with your ability to perform your daily living activities:

very dissatisfied,
dissatisfied,
neither satisfied nor dissatisfied,
satisfied, or
very satisfied?

5. How satisfied are you with yourself:

very dissatisfied,
dissatisfied,
neither satisfied nor dissatisfied,
satisfied, or
very satisfied?

6. How satisfied are you with your personal relationships:

very dissatisfied,
dissatisfied,
neither satisfied nor dissatisfied,
satisfied, or
very satisfied?

7. Have you enough money to meet your needs:

not at all,
a little,
moderately,
mostly, or
completely?

8. How satisfied are you with the conditions of your living place:

very dissatisfied,
dissatisfied,
neither satisfied nor dissatisfied,
satisfied, or
very satisfied?

APPENDIX C

BASIC PSYCHOLOGICAL NEEDS SATISFACTION

AND FRUSTRATION SCALE (BPNSFS)

Basic Psychological Need Satisfaction and Frustration Scale (BPNSNF)

3.1.2. English version

3.1.2.1. Adults

Below, we ask you about the kind of experiences you actually have in your life. Please read each of the following items carefully. You can choose from 1 to 5 to indicate the degree to which the statement is true for you at this point in your life.

1 Not true at all	2	3	4	5 Completely true
1. I feel a sense of choice and freedom in the things I undertake.	1	2	3	4 5
2. Most of the things I do feel like "I have to".	1	2	3	4 5
3. I feel that the people I care about also care about me.	1	2	3	4 5
4. I feel excluded from the group I want to belong to.	1	2	3	4 5
5. I feel confident that I can do things well.	1	2	3	4 5
6. I have serious doubts about whether I can do things well.	1	2	3	4 5
7. I feel that my decisions reflect what I really want.	1	2	3	4 5
8. I feel forced to do many things I wouldn't choose to do.	1	2	3	4 5
9. I feel connected with people who care for me, and for whom I care.	1	2	3	4 5
10. I feel that people who are important to me are cold and distant towards me.	1	2	3	4 5
11. I feel capable at what I do.	1	2	3	4 5
12. I feel disappointed with many of my performances.	1	2	3	4 5
13. I feel my choices express who I really am.	1	2	3	4 5
14. I feel pressured to do too many things.	1	2	3	4 5
15. I feel close and connected with other people who are important to me.	1	2	3	4 5
16. I have the impression that people I spend time with dislike me.	1	2	3	4 5

Basic Psychological Need Satisfaction and Frustration Scale (BPNSNF)

17.	I feel competent to achieve my goals.	1	2	3	4	5
18.	I feel insecure about my abilities.	1	2	3	4	5
19.	I feel I have been doing what really interests me.	1	2	3	4	5
20.	My daily activities feel like a chain of obligations.	1	2	3	4	5
21.	I experience a warm feeling with the people I spend time with.	1	2	3	4	5
22.	I feel the relationships I have are just superficial.	1	2	3	4	5
23.	I feel I can successfully complete difficult tasks.	1	2	3	4	5
24.	I feel like a failure because of the mistakes I make.	1	2	3	4	5

Scoring information:

Autonomy satisfaction: items 1, 7, 13, 19
Autonomy frustration: items 2, 8, 14, 20
Relatedness satisfaction: items 3, 9, 15, 21
Relatedness frustration: items 4, 10, 16, 22
Competence satisfaction: items 5, 11, 17, 23
Competence frustration: items 6, 12, 18, 24

Supportive references:

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APPENDIX D

DEMOGRAPHICS

Please select which physical activity course you are currently enrolled in.

- Beginning, Power & Non-Traditional Yoga & Pilates
- Self-defense
- Weight training (Beginning, Advanced, Strength Training for Women)
- Cardio/Conditioning activities (ROTC, Jogging, Personal Fitness/Training, Triathlon, Group Exercise, Weight Control)
- Outdoor sports (Quidditch, Golf, Tennis, Soccer, Softball)
- Hybrid class (More than one activity/sport)
- Dance (Zumba, Latin, Swing, Shag, Belly, Beginning and Intermediate Social Dance, African)
- CPR
- Water activities (Scuba, Sailing, Kayaking, Canoeing, Beginning & Intermediate swimming, Paddleboarding, Lifeguard Training)
- Outdoor activities (Rock Climbing, Backpacking, Archery, Equestrian, Flying Disc, Snow Skiing, Geocaching, Skateboarding)
- Indoor sports (Bowling, Basketball, Volleyball, Fencing & Intermediate Fencing, Badminton, Racquetball, Karate & Intermediate Karate)
- Not listed (please specify)

Please select your age range.

- ☐ 18 – 24
- ☐ 25 - 34
- ☐ 35 – 44
- ☐ 45 - 54
- ☐ 55 – 64
- ☐ 65 – 74
- ☐ 75 or more

Please tell me your sex.

- ☐ Female
- ☐ Male
- ☐ Non Binary
- ☐ Prefer Not to Say

Please choose your race.

- ☐ White
- ☐ American Indian
- ☐ Middle Eastern or North African
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic Latino or Spanish origin

- Multiracial
- Prefer not to disclose
- Race not listed above (please specify)
- Others (please specify)

Please select your year in school

- Freshman
- Sophomore
- Junior
- Senior
- Graduate
- Other

Indicate which college/school you belong to

- College of Arts and Sciences
- College of Education
- College of Hospitality, Retail, and Sport Management
- School of Law
- School of Medicine
- College of Nursing
- School of Public Health
- Honors College School of Business
- College of Engineering and Computing

- ☐ College of Information and Communications
- ☐ School of Music
- ☐ College of Pharmacy
- ☐ College of Social Work

Have you received mental health services while attending college/university?

- ☐ Yes
- ☐ No

Please provide your email address if you would like to be entered into the Amazon Gift Card raffle.

APPENDIX E

KESSLER PSYCHOLOGICAL DISTRESS SCALE (K10)

The Kessler Psychological Distress Scale (K10)

Kessler Psychological Distress Scale (K10)

Please tick the answer that is correct for you:	All of the time (score 5)	Most of the time (score 4)	Some of the time (score 3)	A little of the time (score 2)	None of the time (score 1)
1. In the past 4 weeks, about how often did you feel tired out for no good reason?					
2. In the past 4 weeks, about how often did you feel nervous?					
3. In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down?					
4. In the past 4 weeks, about how often did you feel hopeless?					
5. In the past 4 weeks, about how often did you feel restless or fidgety?					
6. In the past 4 weeks, about how often did you feel so restless you could not sit still?					
7. In the past 4 weeks, about how often did you feel depressed?					
8. In the past 4 weeks, about how often did you feel that everything was an effort?					
9. In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up?					
10. In the past 4 weeks, about how often did you feel worthless?					