HABRING-FREHLICH, DIANNE M. Ed.D. The Influence of Physical Activity Courses on Stress and Anxiety in Students at a Hispanic-serving Community College. (2022)
Directed by Dr. Jennifer Etnier. 88 pp.

While the severity of college student mental health concerns and the demand for services are increasing (Jones et al., 2018; Watkins et al., 2012), chronically underfunded Hispanic-serving institutions (HSI) (HACU, 2012; Merisotis & McCarthy, 2005) are struggling to meet the mental health needs of their students (ACHA, 2021; Katz & Davison, 2014). This mixed-methods study evaluated the influence of college physical activity courses on the stress and anxiety of students at an HSI community college. Students (n=215) enrolled in a physical activity course and a health lecture class completed pre-, mid-, and post-program surveys to assess stressors (Stressor Questionnaire), coping strategies (BriefCOPE), stress (Perceived Stress Scale, PSS), and anxiety (Beck Anxiety Inventory, BAI-II). Results showed that the frequency with which education and academics were reported as stressors increased in the lecture group and decreased for students in the physical activity class. The physical activity class had a significant decrease in the use of self-blame and a significant increase in the use of instrumental support. Both groups had high pre-program means for stress (23.46 ±6.00) and anxiety (17.34 ±13.76) in comparison to norms. Physical activity students experienced significant (p<.001) reductions in anxiety across the course that moved them below the clinical threshold. The physical activity course students experienced significantly higher reductions in anxiety over the lecture group. Along with the exercise activities included in the physical activity class programming, participants reported that increased accountability, stress management strategies, distraction, and physical benefits helped reduce stress and anxiety. The findings highlight the value of physical activity courses as a component of general education for the physical and

mental health of students, especially those at an HSI who report higher than average stress and anxiety.

THE INFLUENCE OF PHYSICAL ACTIVITY COURSES ON STRESS AND ANXIETY IN STUDENTS AT A HISPANIC-SERVING COMMUNITY COLLEGE

by

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A Dissertation

Submitted to

the Faculty of The Graduate School at

The University of North Carolina at Greensboro

in Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

Greensboro

2022

Approved by

Dr. Jennifer Etnier
Committee Chair

DEDICATION

Dedicated to my late husband, Dr. Shane Frehlich, PhD, for his love, unwavering support, and belief in me, our children, Miles, Max, and Jonas, whose strength, resilience, and compassion inspire me every day, and to my parents Louis and Kathy Habring who inspired my journey.

APPROVAL PAGE

This dissertation written by Dianne M. Habring-Frehlich has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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June 17, 2022

Date of Acceptance by Committee

March 28, 2022

Date of Final Oral Examination

ACKNOWLEDGEMENTS

I would like to express my gratitude to my committee chair, Dr. Jennifer Etnier for sharing my excitement for this study and supporting me through the never-ending data analysis and revisions. Thank you to my committee, Dr. Diane Gill and Dr. Erin Reifsteck, for their valuable insight throughout the process. A heartfelt thank you to Dr. Paula Thomson for her years of cheerleading, support, and mentorship. To the hat-trick, Dr. S. Victoria Jaque, for showing me it is possible to work, research, and parent no matter how big the bumps in the road get. A special thank you to Dr. Christina Dieli-Conwright for her moral support and encouragement.

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College student mental health concerns are becoming more serious and the demand for services are increasing (Jones et al., 2018; Watkins et al., 2012). In 2021, a majority of college students reported feeling stressed and anxious and more than a third felt that anxiety impacted their academic performance (ACHA, 2021). These feelings of stress and anxiety can negatively impact academic success (Fong et al., 2017; Jones et al., 2018). College students in marginalized groups, such as those at Hispanic-serving institutions (HSI), are especially susceptive to the effects of stress (Rogler et al., 1991).

HSI community colleges, which represent about 70% of HSIs (Laden, 2004), serve more racially diverse and socioeconomically disadvantaged students (Katz & Davison, 2014; Laska et al., 2011). Chronically underfunded Hispanic-serving community colleges (HACU, 2012; Merisotis & McCarthy, 2005) are especially impacted by the increasing demand for mental health services because they have fewer available resources, such as student support services, extracurricular activities, and on-campus residential programming, that promote resilience and positive coping than traditional universities (ACHA, 2021; Glover et al., 1999; Johnson, 2009; Katz & Davison, 2014). HSI community college students often commute, are less prepared for college, have fewer financial resources, and may endure additional stress related to balancing two cultures (ACHA, 2021; Glover et al., 1999; Johnson, 2009; Katz & Davison, 2014; Rogler et al., 1991; Zvolensky et al., 2016).

College, which for many is a time of transition into independence, is an opportune time to develop positive coping skills that could evolve into long-term behavior patterns (McFadden, 2016; Nanney, 2015; Nelson et al., 2008; Pedrelli et al., 2015). Though mental health issues are common among college students, a vast majority do not seek help (Blanco et al., 2008). Despite

regular physical activity reducing risk of anxiety symptoms (De Mello et al., 2013; Stubbs et al., 2016), over 50% of college students do not meet physical activity recommendations (ACHA, 2021; ACSM/AHA, 2007). While it may seem simple enough to tell people to move, programs to promote physical activity are crucial because the experience of stress itself inhibits the motivation to be physically active (Stults-Kolehmainen & Sinha, 2014).

In community colleges, physical activity classes give students the chance to learn how exercise can be a constructive coping mechanism for stress and to experience the positive influence of physical activity level on managing anxiety (Legey et al., 2017; Patterson et al., 2019). The need to address students' mental health is even more urgent with the new stressors forced on college students by the COVID-19 pandemic (Khan et al., 2020; Wang et al., 2020). With community college enrollment dropping, the financial strain may impact the availability of classes and programs including opportunities to participate in physical activity classes (Burke & Willis, 2021). Demonstrating the positive influence of physical activity classes on mental wellness and student success can highlight a new avenue with which to address rising student mental health concerns.

Background Literature

The college years are a period of growth that encompass many stressful situations ranging from academic and career pressures to family and social problems (ACHA, 2021; Jones et al., 2018). College life presents new stressors to a student. While some are positive, there are many experiences related to academic life that increase students' anxiety. Frequent evaluation, time commitments, peer competition, new social relationships, managing finances, and more independence are just a few of the challenges that can result in increased levels of anxiety for college students (ACHA, 2021; Jones et al., 2018; Reevy & Frydenberg, 2014).

Community colleges, whose mission is to provide educational opportunities for all including low-income students with weaker academic achievement, make up a majority of the Hispanic-serving institutions. Community colleges make education accessible to underserved and marginalized groups of students who may be less prepared for higher education and have more financial stress (Zeidenberg, 2008). Marginalized student groups have more acculturative stress, family tension, and higher levels of interpersonal trauma (Castillo et al., 2008; Edman et al., 2016), therefore these students have culture-specific stressors (Castillo et al., 2008). Factors, including stress, self-efficacy, social support, and gender account for distress in some groups of marginalized college students (Solberg & Viliarreal, 1997). The multiple layers of stress endured by underserved and marginalized college students place them at higher risk for stress and anxiety (Rogler et al., 1991). Since most college students are between the ages of 18 to 24 years (Digest of Education Statistics, 2018), colleges have the opportunity to help these vulnerable students develop constructive coping mechanisms before they reach the median age of onset for anxiety disorders at 25 (Kessler, 2007).

Stress and Anxiety

Stress and anxiety are interconnected. Stress, the body's reaction to a challenge or demand, can increase the prevalence of anxiety, which is described as an unpleasant and negative emotion characterized by feelings of worry disproportionate to the threat (Lewis, 1970; Kazdin, 2000). Anxiety can manifest in physical symptoms, such as sweating, dizziness, trembling, rapid heartbeat, nausea, feelings of choking, muscle tension, and shortness of breath (Hu et al., 2016; Kazdin, 2000). Additional common symptoms include restlessness, sleep disturbance, and fatigue, which may result in feelings of edginess and irritability (American Psychiatric Association, 2013).

Excessive worrying associated with anxiety is related to poor memory, impaired focus, self-control, and time management (Zainal & Newman, 2018). Anxiety can impair cognitive function in a way that makes it difficult to concentrate (American Psychiatric Association, 2013), thus potentially inhibiting student success.

Anxiety is also often accompanied by other health concerns (Kazdin, 2000). Individuals who regularly experience anxiety-related symptoms over a prolonged period may have chronic health issues like high blood pressure and digestive disorders (Kazdin, 2000). The long-term duress of stress and anxiety can also be associated with the development of heart disease, metabolic syndrome, and obesity (Carroll et al., 2009; Conley & Lehman, 2012; Nousen et al., 2014). Individuals with anxiety are more likely to be unemployed, be more sedentary, and have more comorbidities that reduce quality of life (Toghanian et al., 2014). Low anxiety is associated with higher quality of life, life satisfaction, optimism, self-efficacy, and locus of control (Mills, et al., 2006; Park et al., 2012).

Coping with Stress and Anxiety

College students cope with stress and anxiety in both undesirable and desirable ways (Pierceall & Keim, 2007). Some college students resort to maladaptive coping mechanisms, such as self-punishment, drinking alcohol, smoking, and using illicit substances (Brougham et al., 2009; Pierceall & Keim, 2007). Exercise, socializing with family and friends, and leisure activities are constructive coping mechanisms college students use to cope with anxiety (Pierceall & Keim, 2007).

The promotion of positive coping strategies, such as exercise, benefits students both mentally and physically. In addition to its physical benefits, exercise can reduce the symptoms of anxiety and help manage stressors, thus reducing the use of negative coping mechanisms

(Pierecall & Keim, 2007). The prevalence of anxiety is higher in sedentary individuals (Ghrouz et al., 2019). Active individuals, even those with adverse experiences, are able to engage in effective coping strategies under stressful situations (Thomson & Jaque, 2019).

In addition to negatively impacting physical health, long-term stress and anxiety take a toll on student success (Eisenberg et al., 2016; Jones et al., 2018). To address the high rates of stress and anxiety in college students, colleges are working to reduce student distress through student services, such as college counseling and workshops focused on time management and goal setting (Jones et al., 2018). Unfortunately, the demand for mental health counseling exceeds the availability at community colleges (Eisenberg et al., 2016).

Stress management programming in concert with exercise intervention effectively reduces stress (Stults-Kolehmainen & Sinha, 2014). College programs that partner physical activity programs with student mental health services decrease depressive and anxiety symptoms (Melnyk et al., 2014). Additionally, college physical activity classes that combine physical and relaxation exercises (e.g., guided imagery, tai chi chuan) have also been found to lower anxiety and depression (Cai, 2000). In addition to the mental health benefits, students who engage in physical self-care, such as exercise, also experience less academic stress (O'Neill et al., 2019). Though college programs that integrate mental health services with physical activity have been successful, some students in need are not inclined to access these services (Blanco, et al., 2008). When selecting a coping mechanism, students prefer accessible coping methods because of time and financial constraints (Moore et al., 2021). Since college physical activity classes are often included as a general education requirement, they offer an alternate path to mental health support for students who are less likely to seek help from mental health counseling and student services.

Coping through Physical Activity and Exercise

Physical activity includes all bodily movement that expends energy and exercise is a subset of physical activity that encompasses planned, structured, and often repetitive movement (Caspersen et al., 1985). Moderate to vigorous physical activity levels are associated with lower anxiety and stress and can reduce the increased anxiety associated with excessive sitting in academic settings (Felez-Nobrega et al., 2020; Feng et al., 2014). Participating in physical activity has a protective effect against anxiety symptoms and disorders (Bray & Born, 2004; McDowell et al., 2019). In addition to improved self-efficacy (Mailey et al., 2010), exercise and physical activity increase blood circulation to the brain, improve mood through the release of endorphins and monoamines, and positively influence cortisol levels (Guszkowska, 2004).

Whereas sedentary behavior and screen time increase the prevalence of anxiety, depression, and poor-quality sleep (Wu, 2015); physical activity reduces feelings of anxiety in non-clinical populations (Rebar et al., 2015). Individuals with higher levels of self-reported physical activity have a lower risk of developing anxiety (Schuch et al., 2019), which demonstrates the protective effect of physical activity against anxiety symptoms and disorders (McDowell et al., 2019).

People who do not engage in physical activity are twice as likely to have symptoms of depression and anxiety when compared to those who regularly participate in physical activity (De Mello et al., 2013). According to the 2021 American College Health Association survey, over 50% of college students surveyed did not meet the recommendations from the American College of Sports Medicine and the American Heart Association (2007) for physical activity. These low levels of reported physical activity are associated with more feelings of anxiety (Stubbs et al., 2016). Leisure-time physical activities popular with college students, such as

walking, jogging, and running, are associated with lower levels of depression, a frequent comorbidity of anxiety (Muhsen et al., 2008; Xu et al., 2018).

Exercise reduces anxiety symptoms and tension in both clinical and non-clinical populations (Pedersen & Saltin, 2015). When looking specifically at exercise type, either resistance exercise or aerobic exercise reduce symptoms of anxiety regardless of physical or mental illness (Bartley et al., 2013; Gordon et al., 2017; Herring et al., 2017; Jayakody et al., 2014). Moderate to high intensity regular exercise significantly reduces worry, anxiety, and fatigue while increasing energy, physical function, and vitality (Herring et al., 2016; Herring et al., 2017). Even a single session of exercise with a duration of 15 to 30 minutes resulted in reductions in anxiety and depression (Guszkowska, 2004).

Over the long-term, individuals who participate in regular exercise can enjoy the physiological effects of exercise and the improved psychological mechanisms including increased self-esteem and self-efficacy (Buckworth et. al, 2002; Guszkowska, 2004; Herring et al., 2014, Morgan, 1985; Wipfli et al., 2008). Given its low barriers, exercise training is an accessible and effective preventative measure to manage anxiety and promote mental health (Byrne & Byrne, 1993; Herring et al., 2012) because active individuals are better able to apply coping strategies that promote resilience, thriving, and prosperity (Sarkar & Fletcher, 2014; Thomson & Jaque, 2019).

Community college students, especially those in marginalized groups, can benefit from participation in regular physical activity to help them manage stress and anxiety (Solberg & Viliarreal, 1997). Because of higher levels of stress and lower levels of physical activity, the protective effect of physical activity against stress could be even stronger for HSI college students (Nguyen-Michel et al., 2006). Given the association between physical activity and

stress, HSI students could benefit greatly from promoting physical activity as a low-barrier positive coping strategy.

Purpose and Aims

Physical activity is an effective and accessible coping mechanism for managing stress and anxiety. Physical activity classes offer college students an opportunity to take advantage of the physical and mental health benefits of regular physical activity. The purpose of this study was to evaluate the influence of college physical activity courses on the stress and anxiety of students at an HSI community college. In addition to assessing perceived stress and anxiety, this study also aimed to explore students' stressors and coping strategies. The study included the following specific aims:

Specific Aim #1: Explore the stressors and coping strategies of students enrolled in a physical activity course at a Hispanic-serving institution.

Specific Aim #2: Evaluate how participation in a college physical activity course influences students' perceived stress and anxiety.

Participants were expected to experience a decrease in perceived stress and anxiety accompanying their participation in a college physical activity course. Additionally, participants' feedback was explored to provide better insight into students' specific stressors and coping strategies.

Methods

This investigation evaluated the effects of participation of community college students enrolled in a physical activity course on stress and anxiety in comparison to a group of students at the same college enrolled in a health lecture class. Measures captured demographics and

assessed changes in stressors, coping mechanisms, perceived stress, and anxiety through the beginning, middle, and end of the course term.

All participants provided informed consent which explicitly stated that, while the surveys were class assignments, inclusion in the study was voluntary and the choice not to participate in the study would not influence their grade in the course (Appendix A). Completion of the Qualtrics® survey measures were included as graded assignments (complete or incomplete) and accessed through Canvas, the course learning management system, for students enrolled in the Walking/Running physical activity classes and the Health and Society lecture classes. A survey link was emailed to participants.

Survey data was tracked by an assigned random identification number and coded into SPSS for data analysis by the primary investigator. Participants were assigned a unique identifier to align pre-, mid-, and post-program results. In the case that the principal investigator was also the course instructor, an impartial party held the master list of participants, consents, and unique identifiers to maintain anonymity (Ferguson et al., 2004). Any identifying information was destroyed once the data was downloaded from Qualtrics® into SPSS for analysis.

Participants

With approval from the University of North Carolina Greensboro's (UNCG) Institutional Review Board (Appendix A) and the local institution's Office of Institutional Effectiveness, participants were recruited from a southern California community college serving over 7,000 students, of which 73% are Hispanic and 70% are part-time students. Students from one-unit (52.5 student learning hours) Walking and Running for Fitness physical activity classes (physical activity) and three-unit (157.5 student learning hours) Health and Society lecture classes (lecture) (Appendix B) were approached to join the project at the start of the Summer and Fall 2021

semesters with course terms ranging from 6 to 18 weeks. Depending on the term length, the physical activity class required between 90 minutes and 5 hours of walking/running instruction per week to meet the required student learning hours. The lecture class, another general education requirement within the same department, included instruction explicitly about stress management and mental health and served as a comparison group to assess program-related changes in the physical activity students. Both courses were conducted primarily online due to restrictions related to the COVID-19 pandemic. The sample size included 215 participants (117 physical activity and 98 lecture).

Measures

An online Qualtrics® survey recorded participants' demographics and responses to questions about stress, anxiety, and physical activity. Demographic information, such as age, ethnicity/race, gender, and year in school, was collected at the start of the course and post-program feedback was collected at the end of the course. Pre-, mid-, and post- program measurements of rated and open-ended survey questions about stressors, coping mechanisms, perceived stress, anxiety, and exercise assessed changes in the measures over the course term.

Participants were prompted to complete the surveys during week 1 as part of the course introduction (pre-program), again at the midpoint of the course, and finally during the last week of the course (post-program). The participants in the physical activity course were instructed to complete the survey prior to exercising in class so that acute exercise effects were not being captured.

Stressor Questionnaire. At the commencement, middle, and culmination of the semester, participants responded to open-ended survey questions about stress and anxiety over topics, such as Education/Academics, Finances/Resources, Family/Relationships, Culture/Racial

Ethnic Issues, and COVID-19 (Appendix C). Participants were asked, "Please rate the frequency of the stress, anxiety, or worry you felt over the past month (e.g. Education/Academics)," on a five-point Likert scale (1=*Never* to 5=*Very Often*) for each topic. An open-response question followed each topic asking participants to elaborate on, "What about the topic (e.g. Education/Academics) makes you feel stressed?"

BriefCOPE Inventory. The Brief COPE Inventory assesses the various ways people respond to stressful events (Carver, 1997). Twenty-eight statements about typical responses to difficult or stressful events, such as "I laugh about the situation," and "I give up the attempt to get what I want," are rated on a four-point Likert scale (1=*I haven't been doing this at all*; 2=*A little bit*; 3=*A medium amount*; 4=*I've been doing this a lot*). The scores are summed on scales for each coping mechanism (self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive framing, planning, humor, acceptance, religion, and self-blame). Each coping mechanism has two statements that are summed which then adjusts the rating accordingly (1=*I haven't been doing this at all* to 8=*I've been doing this a lot*), the higher score reflecting a more commonly used coping strategy (Carver, 1997). The instrument is reliable and valid in health-related research (Carver, 1997).

Perceived Stress Scale. Participants rated their perceptions of stress with the 10-item self-report Perceived Stress Scale (PSS) (Cohen et al., 1983; Cohen & Williamson, 1988). The PSS measured the participants' psychological stress over the previous month with a five-point Likert scale (0=*Never* to 4=*Very Often*). Rather than focusing on specific events or experiences, the inventory has individuals rate items general in nature to determine the degree they believe their life has been unpredictable, uncontrollable, and overloaded (Lee, 2012). The four positively

stated items are reverse scored, then scores are summed across all scales. The higher the score, the greater the perceived stress. The instrument is reliable and valid for use with Hispanic Americans (Baik et al., 2019).

Beck Anxiety Inventory-II. The Beck Anxiety Inventory (BAI-II) is a 21-item self-evaluation instrument used to assess severity of anxiety symptoms over the previous month (Beck et al., 1988). The questionnaire asks about common symptoms of anxiety, such as feeling of choking, hands trembling, and heart pounding/racing. The BAI-II scores the severity of anxiety, while distinguishing it from depression. The BAI-II explores 21 symptoms. Individuals rate how much they have been bothered by the symptom in the last month using a four-point scale (0=*Not at all* to 3=*Severely – it bothered me a lot*). The summed scores range from 0-63 with higher scores indicating greater anxiety (Beck et al., 1988). Scores are interpreted as follows: 0-21 (low anxiety); 22-35 (moderate anxiety); and 36 and above (potentially concerning levels of anxiety). High test–retest reliability ($r = 0.75$) and internal consistency ($\alpha = .92$) provide evidence to support that the BAI-II is appropriate to use in research and clinical settings (Beck et al., 1988; Leyfer et al., 2006).

Analysis of Data

The Qualtrics® survey data was downloaded into and analyzed in SPSS. Descriptive statistics were calculated for all measures. Pre-, mid-, and post-program responses to the PSS, BAI-II, GLTEQ, and rated survey questions from the Stressor Questionnaire were analyzed with mixed ANOVA to search for differences in changes across time as a function of treatment (physical activity class, lecture class). The assumption of sphericity was tested using Mauchly's test of sphericity. When the assumption of sphericity was violated, a Huynh-Feldt correction of the degrees of freedom was used. A mixed MANOVA was used to analyze pre-, mid-, and post-

program responses to the subcategories of the Brief COPE as a function of treatment. Significant main effects for time were explored using Bonferroni pairwise comparisons. Significant interactions were followed up by graphing and describing the findings. Differences between group means were compared with independent samples t-tests. When reported, effect size was measured with Cohen's d. For the qualitative data, the primary investigator categorized responses to the open-ended questions into like groups and summarized them by theme. A professor and doctoral candidate with expertise in qualitative research methods from the local institution acted as an impartial party in reviewing the category coding and themes (Thomas, 2006). Only the first response was used for the two students who were enrolled in more than one course and repeated the survey. Eighteen students in the lecture class who were also enrolled in a physical activity class were excluded.

Results

Participants (*n*=215) enrolled in a Walking/Running Physical Activity Course (*n*=117) or a Health Education Lecture, (*n* = 98) completed pre-, mid-, and post-program surveys (see Appendix D). The majority of the participants were female (64%), of Mexican descent (71%), and attending college full time (67%) (see Appendix E).

Participants were enrolled in either a 6-week, 9-week, or 18-week long course term. There were 102 students in the 6-week term (Physical Activity *n*=76, Lecture *n*=26), 20 students in the 9-week term (Physical Activity *n*=20, Lecture *n*=0), and 93 students in the 18-week (Physical Activity *n*=21, Lecture *n*=72) term.

Stressors

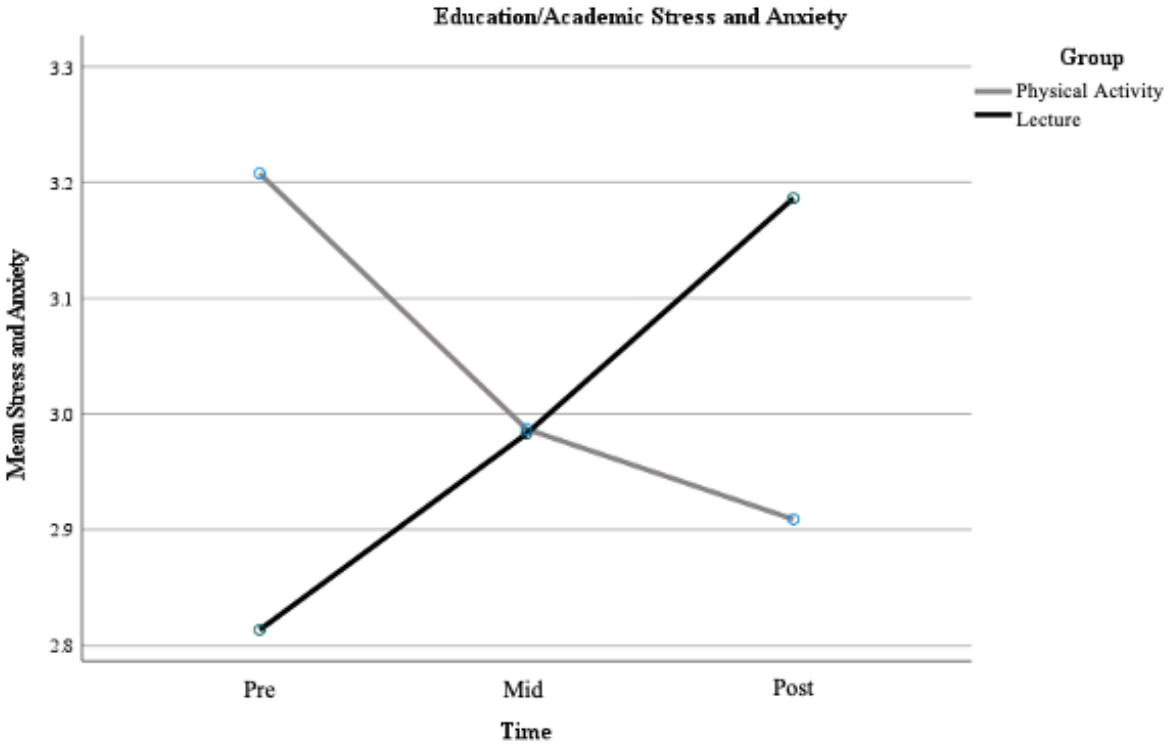
The Stressor Questionnaire was analyzed to explore stressors that trigger feelings of stress, anxiety, and worry. Descriptive statistics for the different topic areas are presented in

Appendix F and the complete results from the mixed ANOVA are in Appendix G. For Education and Academic stressors, there was a significant interaction of time x group, $F(2, 266)=4.02$, $p=.02$, $\eta^2=.03$. Students in the physical activity class experienced a decrease in mean Education/Academics stress and anxiety from pre- to mid-test (d=-0.17), then mid- to post-test, (d=-0.06), whereas the lecture group experienced an increase in mean stress and anxiety from pre- to mid-test (d=0.11), then mid- to post-test (d=0.17) (Figure 1).

For Finances and Resources stressors, there were no significant effects. For Family and Relationships, Culture and Racial-Ethnic Issues, and the COVID-19 pandemic stressors, there was only a significant main effect for time ($p<.05$). Both groups experienced a decrease in mean Family/Relationship stress and anxiety from pre- to mid-test (d=-0.12), then mid- to post-test, (d=-0.15). For Culture and Racial-Ethnic Issues, both groups experienced a decrease in mean stress and anxiety from pre- to mid-test (d=-0.32), then mid- to post-test (d=-0.04). Mean stress and anxiety over the COVID-19 pandemic decreased from pre- to mid-test (d=-0.22), then mid- to post-test (d=-0.06).

Figure 1. Education/Academics Stressor

Mean Scores for Education/Academics as a Stressor



Note. n= 136 (77 Physical Activity Class, 59 Lecture); Stressor Questionnaire (1=*Never* to 5=*Very Often*).

Qualitative Descriptions of Stressors

After rating the frequency with which they felt stress and anxiety about Education/Academics, Finances/Resources, Family/Relationships, Culture/Racial-Ethnic Issues, and the COVID-19 Pandemic in the pre-, mid-, and post-survey, physical activity course participants described in an open-response format what caused them stress about each area. For this qualitative measure, the responses for each area were tabulated into common categories, then into overarching themes (Appendix H). The unique themes were analyzed with frequencies to evaluate their prevalence during the pre-, mid-, and post-program surveys and reported by topic area (Appendix I).

Education and Academics. Education and academics stressors were classified into four common themes identified in order of frequency: Academics, None, Future, and Life Balance. The theme of Academics included time management, grades, concern about passing, understanding the course content, course term length, and the specific subject matters of math and science. This was the most frequently mentioned stressor over all the topic areas. Having no concerns or worries were reported the next most frequently. Future was reported in relation to stress and anxiety over transfer, graduating, and career plans. Life Balance included dividing time between work/school/social life, mental health, enjoyment, and transportation.

Finances and Resources. Five themes emerged from the reported sources of stress and anxiety over finances and resources, which included Living Expenses, No worries, Education, Family, and Economics. Living Expenses were the most frequently mentioned financial stressor. Living expenses encompassed affording necessities, resources to live independently, lack of savings, employment, bills, unexpected expenses, debt, and budgeting. After No Worries and Living Expenses, the next most frequently reported comments were about the lack of concern over financial resources. Paying for school and dread of student debt were mentioned as sources of stress over finances related to Education. Being a single parent and helping parents was reported in the Family theme. Economics, inflation, and financial impact of COVID was the least reported sources of financial stress and anxiety.

Family and Relationships. The themes of stressors for family and relationships were: No worries, Emotional Needs, Responsibilities, Health, and Social Needs. No worries, all is good, and happiness was reported most often. Emotional Needs were the most reported stressor in relation to not enough quality time with loved ones, conflict, and lack of emotional support. Stress and anxiety over Responsibilities, such as meeting family expectations, care for younger

siblings, parenting, and making people happy, were reported. The Health theme was reported in regard to worry about grandparents, medical issues, COVID, and concern over loved ones being all right. Social Needs related to distress over family being far away, socializing after COVID, feelings of isolation, and cultural expectations and attitudes (e.g. machismo) were reported as stressors.

Culture and Racial-Ethnic Issues. No Worries, Prejudice/Racism, Inequality, and Violence were the themes comprised by the Culture Racial-Ethnic Issues stressors. The lack of worry, concern, and everything is all right about this topic were the most reported comments. Prejudice/Racism was the most frequent stressor, which encompassed comments about skin color, language barriers, discrimination, extremists, machismo/machista, and feelings about lack of acceptance. The theme of Inequality was the next most reported stressor referencing racial inequities, deportation, national/global issues in society around race. Comments were also made about Violence regarding racial violence, attacks on Mexican food vendors, and hate crimes.

COVID-19 Pandemic. No Concerns, Health/Death, Lifestyle, Social, and Economics surfaced as COVID-19 pandemic stressors themes. A majority of respondents reported No Concern about the pandemic. Worry about the Health/Death of themselves and loved ones was the most reported stressor. The worries about death included leaving children without parents, grieving lost loved ones, and not being prepared for death. Other health stressors surrounded the transmission, the vaccine, and the pandemic's impact on mental health. Lifestyle was discussed as the next most frequent stressor, which included: concern about the impact of other people not following recommended guidelines; anti-vaxxers; the duration of the pandemic; and constantly changing precautions. Social stressors around isolation, being in public, children going to school, and returning to pre-COVID ways were also reported. Comments about Economics as a stressor

were made in relation to lack of work, extra shifts, working online, job loss, and national/global finance.

Coping Strategies

To analyze coping strategies employed by the participants, descriptive statistics (Appendix J) and a mixed MANOVA (Appendix K) were performed on the mean value calculated from the pre-, mid-, and post-program scores for the subcategories of the Brief COPE. The coping strategies were then divided into adaptive/positive and maladaptive/negative coping strategies (Meyer, 2001) and overarching coping styles: Problem-focused, Emotion-focused, and Avoidant Coping (Hegarty & Buchanan, 2021). The higher the score, the more frequently a coping strategy is used.

Adaptive/Maladaptive Coping Strategies. There were no significant effects for the use of adaptive coping strategies. Time was the only significant effect for the use of maladaptive coping strategies, Wilks's $\Lambda = .91$, $F(12, 522) = 2.18$, $p = .01$, $\eta^2 = .05$. Univariate follow-ups indicated that the main effect for time was significant for self-blame, $F(1.90, 253.12) = 7.04$, $p = .001$, $\eta^2 = .05$. Follow-up pairwise comparisons show pre-program scores were significantly higher than mid- ($p = .005$, d=-0.22) and post-program scores for self-blame ($p = .01$, d=-.024).

Coping Styles. To examine coping from another perspective, the subcategories of the Brief COPE can be organized into three overarching coping styles: Problem-focused, Emotion-focused, and Avoidant Coping (Hegarty & Buchanan, 2021).

For Problem-Focused coping, there was only a significant multivariate effect for time, Wilks's $\Lambda = .93$, $F(8, 518) = 2.28$, $p = .02$, $\eta^2 = .03$. Follow-up univariate tests demonstrate that this effect was significant for instrumental support, $F(1.97, 257.39) = 3.75$, $p = .03$, $\eta^2 = .03$.

Pairwise comparisons show that the use of instrumental support increased significantly from pre- to post-program (p=.04, d=0.23).

For Emotion-Focused coping**,** there was only a significant multivariate effect for time, Wilks's Λ= .91, $F(12, 526) = 2.19$, p=.01, η^2=.05. Univariate tests demonstrated this was significant for the use of self-blame, $F(1.92, 259.31)=6.51$, p=.05, η^2=.03. Pairwise comparisons show a significant decrease from pre- to mid- (p=.01, d=-0.22) and from pre- to post-program (p=.01, d=-0.23).

For Avoidant Coping, there were no significant effects.

Perceived Stress and Anxiety

Descriptive statistics for the PSS are presented in Appendix L. There was a significant main effect for time, $F(2, 270)=16.55$, p<.001, η^2=.11. In follow-up pairwise comparisons, the pre-program score decreased significantly from pre- to mid-program (p=.01, d=-0.19), from mid- to post-program (p=.01, d=-0.18), and from pre- to post-program (p<.001, d=-.041). There was no significant main effect for group, $F(1, 135)=0.04$, p=.85, η^2=.00, and no significant interaction of time x group, $F(2, 270)=1.76$, p=.17, η^2=.01.

Descriptive statistics are presented for the BAI-II in Table 1. There was a significant main effect for time, $F(1.94, 275.27)=8.15$, p<.001, η^2=.05. Follow-up pairwise comparisons show that the pre-program score was significantly higher than the post-program score (p=001, d=0.13). Group had no significant main effect, $F(1, 142)=1.57$, p=.21, η^2=.01. Time x group had a significant interaction, $F(1.94, 275.27)=5.37$, p=.01, η^2=.04 (Figure 2). From pre- to mid-program, mean anxiety in the physical activity class declined (d=-0.10) below the clinical threshold of 16 (Beck & Steer, 1993), then continued to decrease from mid- to post-program (d=-0.31). The lecture group decreased pre- to mid-program (d=-0.16), then increased from mid-

to post-program (d=0.07), remaining above the clinical cut-off point. The percentage of participants above the clinical threshold for anxiety in the physical activity class dropped 21%, whereas there was no change in the lecture class (Table 2).

Table 1. Beck Anxiety Inventory-II

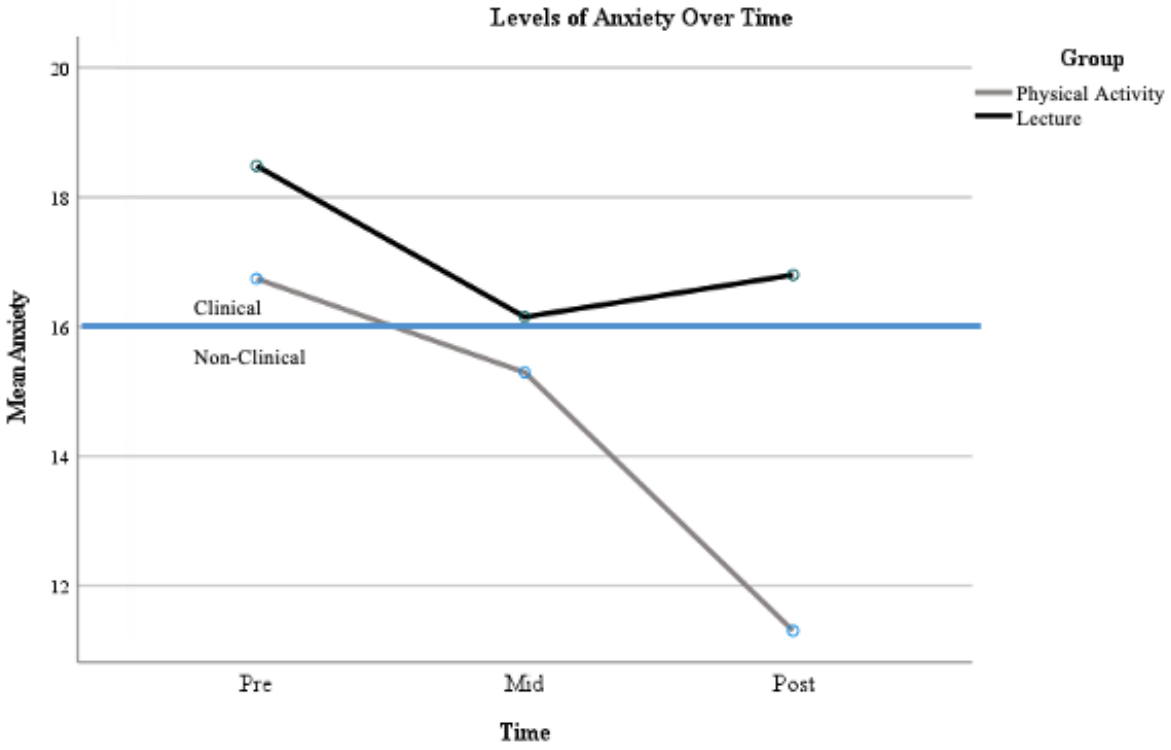
Severity of Anxiety Symptoms by Group

	Physical Activity	Lecture	Total
Pre	16.74 ±13.17	18.20 ±14.65	17.34 ±13.76
Mid	15.29 ±14.26	15.97 ±13.24	15.57 ±13.81
Post	11.31 ±11.31*	17.00 ±14.86	13.64 ±13.14

Note. n=145 (85 Physical Activity Class, 60 Lecture); Beck Anxiety Inventory-II. Summed scores range from 0-63 categorized by: 0-7 minimal anxiety; 8-15 mild anxiety; 16-25 moderate anxiety; 26-63 severe anxiety; Data are presented as M ±SD, *p<.05 = significant difference between groups.

Figure 2. Group Changes in Anxiety

Changes in Mean Anxiety by Group over the Program



Note. n=145 (85 Physical Activity Class, 60 Lecture); Estimated marginal means of pre-, mid-, and post-BAI-II scores. A score of 16 or more indicates clinical levels of anxiety (Beck & Steer, 1993).

Table 2. Frequency of Clinical Anxiety Level

Participants with Clinical Levels of Anxiety

	Physical Activity		Lecture	
	Frequency	Valid %	Frequency	Valid %
Pre	54	46.2	46	46.9
Mid	36	38.3	33	45.8
Post	27	28.4	33	48.5

Note. n=215 (117 Physical Activity Class, 98 Lecture) A score of 16 or more indicates clinical levels of anxiety (Beck & Steer, 1993).

Post-Program Feedback

At the end of the program, participants were asked to rate how the course helped them deal with stress and anxiety. Descriptive statistics are presented for the post-program feedback in Table 3 and independent t-test results in Appendix M. Group had a significant effect on an Increase in Stamina, $t(150)=3.27$, $p=.001$, such that stamina for the PA group was higher than for the lecture group (d=0.53). For Improving Mood, group had a significant main effect, $t(110.65)=2.60$, $p=.01$, such that improved mood for the PA group was higher than for the lecture group (d=0.44). Boost Energy also had a significant main effect for group, $t(150)=3.95$, $p=<.001$, such that energy was higher for the PA group than for the lecture group (d=0.48).

After rating how the course helped with stress and anxiety, participants were asked to describe in their own words how the course helped them deal with stress and anxiety. Physical activity class post-program feedback was classified into five common themes: Accountability (n=25), Stress Management/Mental Health (n=17), Distraction (n=14), Physical Benefits (n=12), and Mindfulness (n=5) (Appendix N). The theme of Accountability included motivation, being

consistent, being held accountable, increasing duration, and getting me outside. The theme of Stress Management/Mental Health included teaching how exercise can be used as a coping mechanism to manage stress and as a tool to improve mental wellness. Distraction included how participating in the class allowed a break from other worries. Physical benefits included the release of energy, deep breathing, the benefits of moving, and increased energy. Mindfulness included being mindful and self-care, such as making time to focus on myself.

The health lecture class post-program feedback was classified into four common themes: Coping Strategies (*n*=20), Awareness (*n*=14), Connection/Expression (*n*=10), and Resources (*n*=4) (Appendix N). The Coping Strategies theme included learning ways to deal with stress, advice on how to cope, strategies to tackle stress, and ideas of how to release stress. Awareness included education on how stress affects the body, awareness of the signs, opened eyes about how stress can impact health, and put stress into perspective. The theme of Connection/Expression encompassed feeling acknowledged, hearing what others are going through, not feeling alone, and the opportunity to express emotions. The Resources theme reminded participants of the resources and outlets available for support.

Table 3. Post-program Course Feedback

Influence of Course on Stress and Anxiety by Group

	Physical Activity	Lecture	Total
Reduce Stress & Anxiety	3.38 ±1.05	3.14 ±1.14	3.28 ±1.09
Increase Stamina	3.41 ±0.95*	2.83 ±1.21	3.16 ±1.11
Relieve Stress	3.71 ±0.93	3.42 ±1.14	3.59 ±1.03
Improve Mood	3.77 ±0.86*	3.30 ±1.24	3.57 ±1.07
Boost Energy	3.81 ±0.88*	3.17 ±1.15	3.53 ±1.05
Improve Quality of Sleep	3.30 ±1.12	3.24 ±1.23	3.28 ±1.16

Note. n=152 (86 Physical Activity Class, 66 Lecture); (1=*Not at all* to 5= *A great deal*); Data are presented as M ±SD, *p<.05 = significant difference between groups

Discussion

This study explored the influence of participation in a college physical activity class on the stress, anxiety, and coping strategies of students at an HSI community college. A majority (71%) of the participants were of Mexican descent, which yields insight into an under-researched population of students (Ickes & Sharma, 2012). The HSI students reported overall higher stress (M=23.46 ±6.00) and anxiety (M=17.34 ±13.76) than have been previously reported in non-HSI peers [stress (M=21.1 ±7.2) (Cohen & Williamson, 1988); anxiety (M=16.88 ±13.32) (Ritvo et al., 2021)]. While they share similar education and academic stressors (Darling et al., 2007), they have unique financial concerns and cope with stress and anxiety differently (Carter et al., 2015; Heckman et al., 2014). The HSI students in the physical activity class experienced additional benefits managing anxiety in comparison to the health lecture students.

In comparing sources of stress, anxiety, and worry over the three-program time points, results indicated that education/academics was the most reported stressor. Participants noted that academic concerns, such as grades, time management, course term length, and worry about passing courses, caused the most stress and anxiety. These are typical stressors shared by college students (Darling et al., 2007), which demonstrates minority students at an HSI share similar sources of stress with students at non-HSIs.

Whereas education and academics increased as a reported stressor in the lecture group, it decreased for students in the physical activity class. Since academic stress is strongly associated with anxiety (Jones et al., 2018), this decrease in education and academics as a source of stress, anxiety, and worry demonstrates the mental health benefits associated with participation in a physical activity class (Bray & Born, 2004; Feng et al., 2014).

After education and academics, the second most reported stressor was living expenses. Rather than the two most typical financial stressors for college students, lack of discretionary income and high student loan debt (Heckman et al., 2014), students reported their main financial concerns to be the cost of necessities, housing, transportation, and unexpected expenses. This distress over living expenses may be associated with the high cost of living in Southern California (*Cost of Living Data Series*, 2021). Student loan debt may be less of a stressor because of affordable tuition and the senate bill AB19 California College Promise, which covers two years of community college tuition for graduating seniors who are first-time, full-time students (*California College Promise Grant*, 2022). Living expenses, rather than tuition, as a major stressor has implications for student services and financial aid.

Emotional needs, such as lack of support, conflict, and not enough quality time with family, was the most-reported stressor around family and relationships. Because emotional support from family can reduce academic stress (Jones et al., 2018), this stressor has implications on student success. Though there was a decrease in concern over the COVID-19 pandemic, worry over physical and mental health of self and family persisted as a stressor.

Given the large Hispanic population, it should be noted that cultural and racial-ethnic issues were the least reported source of stress, anxiety, and worry. The homogeneity of the student body's current environment might factor into that outcome. For HSI students, culture and racial/ethnic issues may evolve as a stressor for those who transfer to a university with a different composition of diversity (Lopez, 2005). Findings related to the sources of stress, anxiety, and worry can be applied to develop culturally-competent curricula and targeted as areas of support by student services (Hansen, 2014).

Over time, there was a significant decrease in the use of maladaptive coping strategies (self-blame and self-distraction) and a significant increase in the use of instrumental support. While these coping strategies are not specifically targeted by course objectives, it is possible the physical activity and health lecture class curricula influenced these changes. The use of substances, such as alcohol and drugs, had the lowest mean as a coping strategy. This is a difference from many college campuses where alcohol and drugs are frequently used to manage stress (Carter et al., 2015). The positive changes in coping observed over the term suggest there is an opportunity for college courses to help develop healthy long-term behaviors through explicitly teaching constructive coping mechanisms (McFadden, 2016; Tarar & Akhtar, 2021).

One of the class objectives was to gradually build towards a three-mile walk/run. Due to the COVID-19 pandemic, course instruction was conducted primarily online, therefore the attainment of this goal was not directly observed. As the pedagogy of online physical activity classes is evolving, there may be an opportunity to explore the application of digital technologies to promote consistent physical activity levels (Bodsworth & Goodyear, 2017).

While physical activity is viewed as a positive stress management technique, fatigue and time constraints related to high levels of stress can inhibit physical activity (Nguyen-Michel et al., 2006). Pre-pandemic normative data suggests that the reported levels of perceived stress were higher than average (Cohen & Williamson, 1988). In both the physical activity class and the lecture group, perceived stress decreased significantly over the course. Even with the significant decrease, mean perceived stress remained higher at the end of the course in comparison to the norms.

Since anxiety is deemed a common response to perceived stress (Racic et al., 2017), it follows that pre-program mean anxiety was also elevated over that of typical college students

(Haft & Zhou, 2021). Both the physical activity class and lecture group started the semester with clinical levels of mean anxiety. While both the physical activity class and the lecture group experienced a significant decrease in anxiety over the program, anxiety in the physical activity group decreased significantly relative to the lecture group. The physical activity class's mean anxiety fell below the clinical anxiety level, while the mean anxiety for the lecture group remained above the clinical cutoff. In the physical activity course, the percent of students with clinical levels of anxiety dropped from 46% to 28%; whereas the lecture saw no change in the percent of students with clinical levels of anxiety.

The high percentage of students beginning the term with clinical levels of anxiety and the influence of the physical activity class on reducing anxiety below clinical levels is persuasive. In addition to promoting movement, college physical activity classes can employ adaptive coping praxis, nurture an anxiety-reducing environment, and explicitly teach positive coping strategies (Cai, 2000). The decline in anxiety, which occurred amidst the COVID-19 pandemic, racial tension, and the suspension of in-person classes, speaks to the benefit of the curriculum and instruction.

Though mentioned as an academic stressor, further analysis revealed that course term length had no significant influence on perceived stress or anxiety. This suggests that students experience the same pattern of decreasing stress and anxiety over any length of course term and that shorter-term classes do not increase anxiety, which could have implications on class scheduling.

While the lecture class explicitly taught about stress management, the physical activity class offered implicit benefits to manage stress and anxiety. Physical activity students reported improved mood and boosted energy. They attributed this to accountability, the benefits of

exercise on stress management, being distracted from problems, and becoming more mindful. In addition to the physical benefits, physical activity classes teach about the stress management benefits of exercise, provide accountability, and employ coping skills and self-care, which help across all aspects of students' lives.

Since exercise is an effective and accessible coping mechanism for managing stress and anxiety, college physical activity classes offer students an opportunity to take advantage of the physical and mental health benefits of regular physical activity (Cai, 2000; McDowell et al., 2019). Less anxious students are more successful, so the benefits of physical activity classes extends into success in other aspects of their academic career (Fong et al., 2017; Jones et al., 2018). As an important component of general education, physical activity classes teach students (median age 21) constructive coping mechanisms that provide the fundamentals for developing healthy long-term behaviors before 25, the critical median onset age of anxiety disorders (Kessler, 2007; McFadden, 2016; Nanney, 2015; Nelson et al., 2008; Pedrelli et al., 2015).

Limitations

Limitations to this study include recruitment of participants from one institution, no intervention, and no random assignment. The lack of a physical activity measure, activity tracking, and a measure to assess the physiological effects of exercise are other limitations to this study. While data was collected through the Godin Leisure Time Exercise Questionnaire, the self-report data was incomplete and unreasonable scores were reported, therefore this data was deemed to be neither reliable nor valid. The course term length, differences between the one- and three-unit classes, type of physical activity course, and online format also presented limitations. While there were no statistically significant differences in results between course term lengths (Appendix O), the number of weeks over which a course spans could possibly influence the

participants' responses between the pre-, mid-, and post-surveys because the length of time varies between each survey depending on the total number of weeks in a course term. Another limitation is that some participants completed the pre- and mid-surveys yet did not complete the post-survey. Therefore, some statistical analyses only include cases with data complete for all analyzed variables, rather than examining all of the participants. Due to the COVID-19 pandemic, the courses were delivered online, as opposed to in-person, which could present another limitation. Though there are many different types of physical activity courses offered, participants were only recruited from Walking/Running for Fitness courses. Future studies may want to consider including in-person courses and a greater variety of physical activity courses.

Conclusion

Because HSI college students at HSIs endure higher levels of stress and anxiety, physical activity courses can play an important role in promoting mental wellness and more specifically in decreasing anxiety. The findings suggest that stress and anxiety are highest at the beginning of a course term and, as the term progresses, those enrolled in a physical activity course experience significant reductions in anxiety that move them below the clinical threshold. The mental health benefits and associated decreases in academic stress can play a role in promoting student success and retention (Fong et al., 2017; Jones et al., 2018).

The findings of this mixed methods study highlight the value of physical activity courses as a component of general education for the physical and mental health of students, especially those at an HSI who report higher than average stress and anxiety. This relationship between physical activity courses and mental health suggests that physical activity course curriculum should include student learning objectives related to mental wellness and coping.

Students with potentially concerning levels of anxiety may need multiple avenues, such as physical activity and health classes, and student services, through which to address their mental health needs. Since the median age of onset for anxiety disorders is 25 (Kessler, 2007), it is important for college students to experience the anxiety-reducing benefits of physical activity classes to develop constructive coping mechanisms that build a foundation for healthy long-term behavior patterns (McFadden, 2016; Nanney, 2015; Nelson et al., 2008; Pedrelli et al., 2015). Preventative strategies, such as exercise and constructive coping mechanisms taught in physical activity classes, can benefit HSI students and those vulnerable to anxiety disorders benefit before they reach the onset age of developing anxiety disorders (de Lijster et al., 2017). In addition to helping develop positive coping strategies over the long-term, physical activity classes also help reduce academic stress in the short-term (Fong et al., 2017; Jones et al., 2018).

CHAPTER II: DISSEMINATION

This project will be disseminated as a report and visual presentation to the kinesiology, student services, counseling departments, college administration, and professional development committee. The findings will also be included as part of the annual program review. The presentation will point out the high levels of stress and anxiety unique to students at the Hispanic-serving Institution and highlight the benefit of the physical activity courses to the students' mental health. The presentation will summarize the findings and how they can be applied to the college schedule, curriculum, recreational activities, and student support services. This project will also be submitted to a journal for publication consideration.

Presentation Details

This presentation will be submitted to the local institution's professional development committee to be offered during the Fall 2022 workshops. The goals of this presentation are to draw attention to the mental health challenges faced by the institution's college students, the benefits of physical activity classes, and implications for practice. The script references visual presentation slides (Appendix P).

Introduction (Slide 1)

Hello. Thank you for your time today. My name is Dianne Frehlich and I would like to talk to you about how physical activity classes can play a role in promoting mental health at Hispanic-serving institutions, like ours. First, a little background about how my interest in this topic evolved. Of my 17 years teaching, the last 8 have been at our institution, a Hispanic-serving (HSI) community college, teaching both health lectures and physical activity classes. During these classes, my students have frequently expressed concerns about mental health and regularly asked for more information about anxiety and how to manage it. The results of the Fall

2019 American College Health Association (ACHA) survey at our institution reinforced how serious concern the over anxiety is among our student population.

If you don't recall offhand, here's a little recap: 20% of the respondents revealed that they had been clinically diagnosed with anxiety, 40% of the students reported feeling highly distressed, and over 75% of students did not meet physical activity recommendations. I started seeing some connections. That was the moment that educating students about physical activity as a coping mechanism for stress and anxiety became a mission for me. Fast forward a few months and the COVID-19 pandemic struck our families, our way of life, and shook the education system. Here we are, with declining enrollment, our department actively competing to maintain our programs, and fighting harder than ever to demonstrate the value of physical activity classes. And after the online swimming class parody a few years ago, we need hard evidence that demonstrates the benefits of our physical activity classes.

Background (Slide 2)

Since we are all professionals, let's consider the research for a moment. There is a wealth of evidence that demonstrates college students are stressed and anxious and that exercise can help with those feelings and symptoms. We know that the students we serve have a higher risk of struggling with their mental health and fewer resources available to address those needs. Our students are not alone in this. Even before the pandemic, a majority of college students across the country described feeling hopeless and exhausted and experiencing overwhelming anxiety. Now, the pressure for chronically underfunded Hispanic-serving community colleges, like ours, to meet their students' mental health needs has further increased. Unfortunately, we don't have the same resources that promote resilience and positive coping as institutions with on-campus services, such as extracurricular activities, campus housing, and a recreation center.

Because of this, community colleges, like us, which represent about 70% of Hispanic-serving Institutions, need to pay special attention to their students' mental health needs. College is a time of transition into independence. This is the time to develop positive coping skills that could evolve into long-term behavior patterns. Though mental health issues are common among college students, a majority do not seek help. Many people acknowledge that physical activity is great for managing stress, but there is a catch-22. Negative feelings of stress can make you feel less like moving. When you acknowledge that, it is no surprise that over 50% of college students do not meet physical activity recommendations from the American College Sports Medicine/American Heart Association. People who exercise regularly are half as likely as sedentary people to experience symptoms of depression and anxiety. Let's take a little detour and talk about stress and anxiety for a moment. Stress can increase the prevalence of anxiety, which is described as an unpleasant and negative emotion characterized by feelings of worry disproportionate to the threat. Anxiety can manifest in symptoms (e.g. muscle tension, sleep disturbance, nausea, feelings of choking, shortness of breath, restlessness, edginess, fatigue, feelings of irritability). Anxiety is related to poor memory, self-control, and time management, which can negatively impact student success. Low anxiety is associated with higher quality of life and life satisfaction.

With community college enrollment dropping, we know that we are headed towards financial strain that will impact the availability of classes and programs. We need direct evidence that physical activity classes positively impact not only the physical health of our students, but also their mental health. When I say mental health, it's not simply the acute benefits of exercise. In addition to the physical benefits, physical activity classes teach about the stress management benefits of exercise, provide accountability, and employ coping skills and self-care, which help

across all aspects of our students lives. Colleges have a prime opportunity to help these vulnerable students develop constructive coping mechanisms. Thankfully, we are connecting with students between the ages of 18 to 24, before the median age of onset for anxiety disorders at 25.

Methodology (Slide 3)

I conducted a study to explore how college physical activity courses influenced stress and anxiety of students at an HSI community college, an under researched population. This study was approved by the UNCG IRB and our local institution's Office of Institutional Effectiveness. At the time this project began, our community college was serving over 7,000 students, of whom 73% were Hispanic and 70% were part-time students. Recruitment occurred at the start of the Summer and Fall 2021 terms. Students from Walking and Running for Fitness physical activity classes and Health and Society lecture classes were recruited. The class terms ranged from 6 to 18 weeks. The one-unit physical activity class was the treatment group and the three-unit Health and Society class was the comparison group. The physical activity and health classes were conducted primarily online.

There were 215 students who participated (117 physical activity and 98 lecture). Three online surveys were administered at week 1 (pre-program), the midpoint of the course, and the last week of instruction (post-program). Students in the physical activity course were instructed to complete the survey prior to exercising, so that acute exercise effects were not captured. The survey captured demographic data (age, race/ethnicity, gender, status in school), qualitative and quantitative information about sources of stress (stressors), the use of coping strategies (BriefCOPE Inventory), physical activity level (GLTEQ), psychological stress over the previous

month (Perceived Stress Scale) and severity of anxiety symptoms over the previous month (Beck Anxiety Inventory-II).

The data was analyzed in SPSS. Descriptive statistics were calculated for all measures. Pre-, mid-, and post-program responses to the quantitative surveys were analyzed with mixed ANOVA to search for differences in changes across time as a function of treatment (physical activity class, comparison group). Responses to the open-ended questions were categorized into like groups and summarized, then reviewed by one of our colleagues who has experience in qualitative research methods.

Demographics (Slide 4)

There were 215 participants: 117 from the Walking/Running Physical Activity Course and 98 in the Health Education Course. The students who participated in this research are generally representative of our college. The students were 64% female (n=137), 33% male (n=72), and 3% transgender/other/prefer not to state (n=6). Their racial/ethnic background was 71% Mexican (n=153), 11% White/Caucasian (n=24), 6% Asian (n=12), 3% Black/African American (n=7), 3% Central American (n=7), and the other 6% were comprised of Native Hawaiian/Pacific Islander (n=4), Other (n=4), Other Spanish, Hispanic, or Latino origin (n=2), American Indian/Alaska Native (n=1), and prefer not to state (n=1).

Looking at student status, 143 students were full-time (Physical Activity n=77, Lecture n=66), 60 were part-time (Physical Activity n=30, Lecture n=30), and 10 described themselves as other (Physical Activity n=8, Lecture n=2). Please note that this sample has a higher percent of full-time students relative to the complete student body. This is important because stress and anxiety can be higher in part-time students. There were three different course term lengths, 102 students in the 6-week term (Physical Activity n=77, Lecture n=66), 20 students in the 9-week

term (Physical Activity n=77, Lecture n=66), and 93 students in the 18-week term (Physical Activity n=77, Lecture n=66). Though 215 participants enrolled in the study, some participants did not complete all of the time points for every measure, therefore the number of participants may vary by analysis.

Stressors (Slide 5)

Stressors were explored both quantitatively and qualitatively. Students in the physical activity class experienced a decrease in mean Education/Academics stress and anxiety over time and the lecture group experienced an increase in mean stress and anxiety over time (significant interaction of time x group). When asked to describe their stressors in their own words, students reported academic concerns most frequently. They felt stress, worry, and anxiety over time management, grades, concern about passing, understanding the course content, course term length, and the specific subject matters of math and science. This was the most frequently mentioned stressor over all the topic areas. These are typical stressors shared by college students, which demonstrates minority students at an HSI share similar sources of stress with students at non-HSIs. Since academic stress is strongly associated with anxiety, the decrease in education and academics as a source of stress, anxiety, and worry demonstrates the mental health benefits associated with participation in a physical activity class.

Stressors (Slide 6)

As I mentioned, stressors were explored both quantitatively and qualitatively. We just talked about the top stressor, academic concerns, now I would like to discuss some atypical sources of stress. Rather than the two most typical financial stressors for college students, lack of spending money and high student loan debt, our students are most worried about living expenses,

such as affording necessities, resources to live independently, lack of savings, employment, bills, transportation, unexpected expenses, debt, and budgeting.

Living Expenses were the most frequently mentioned financial stressor and the second most reported stressor overall. This concern could be rooted in the high cost of living in Southern California. It is possible that the California College Promise has reduced stress over tuition and student loan debt for our students. Considering the stress over living expenses, we may want to add financial wellness to our health curriculum to help connect students with the relevant services we offer on campus.

It is noteworthy, given the large Hispanic population, cultural and racial-ethnic issues were the least reported source of stress, anxiety, and worry. Does our institution's connection to the community factor into that? This may evolve as a stressor for those who transfer to a university with a different environment. We need to acknowledge this and continue to support our students as they prepare for transfer.

Coping (Slide 7)

Coping strategies were explored through different subcategories to look at a variety of perspectives. In separating out adaptive (positive) and maladaptive (negative) coping strategies, both groups decreased the use of negative coping strategies over the semester. There was less self-blame and less self-distraction. You can also look at coping through overarching styles, problem-focused, emotion-focused, and avoidant coping. Over the semester, both groups increased the use of problem-focused coping. Specifically, they increased the use instrumental support. That means that they took advantage of the resources around them. Their use of emotion-focused coping decreased, specifically they used self-blame less, which I mentioned earlier was a negative coping strategy.

Anxiety (Slide 8)

We learned again that our students have anxiety. Both the physical activity class and lecture group started the semester with clinical levels of mean anxiety. Both groups experienced a significant decrease in anxiety over the course term, but the lecture class still was still at clinical levels. Let's look a little closer at the physical activity class. Their mean anxiety fell below the clinical anxiety level. The percent of students with clinical levels of anxiety dropped from 46% to 28%; whereas the lecture saw no change in the percent of students with clinical levels of anxiety. Remember, less anxiety means better concentration, memory, self-control, and time management. These factor into the academic success of college students and quality of life.

Summary (Slide 9)

Let's quickly summarize what I've just shared. This study explored the influence of participation in a college physical activity class on the stress, anxiety, and coping strategies of students at a HSI community college. We found out that our students are just like other students. They are very stressed and anxious about academic concerns like passing classes, their grades, and managing time. The physical activity class helped them significantly decrease that stress/anxiety over academics. Less stress and anxiety can improve academic success through better concentration, memory, self-control, and time management.

Our students differ from typical college students over financial stress because they are more worried about living expenses than they are about paying for college. All of the students improved their coping mechanisms. They used less self-blame and self-distraction and became more likely to reach out to use the resources on our campus. That last one bears repeating, the students became more likely to reach out and take advantage of support services.

Again, less anxiety means improved concentration, memory, self-control, and time management. Low anxiety translates to improved quality of life. I started this study with the intention to generate evidence-based research about how the mental health benefits of exercise extend to college physical activity classes. I came away with something more powerful, important, and personal. While explicit interventions, such as counseling, are very important pieces of addressing mental health, the implicit benefits of movement like exercise, dance, and recreational sports, are extraordinarily powerful too. To meet the mental health needs of our students, we need to help them take advantage of these opportunities to experience these implicit benefits.

Professional Implications (Slide 10)

Less stress and anxiety translates to increased student success. We need to develop recreational programs that program physical activity, such as intramurals, free classes, opportunities outside of classes to try out the fitness center, and a new outdoor workout space. As we review our curriculum, we need to update and create new physical activity curriculum based on student preferences (Zumba, HIIT, stress management). Our department needs to review our SLOs to make sure that we have a mental health SLO in our physical activity classes. Physical activity and health lecture course content should be updated to add objectives related to the explicit instruction of coping strategies. We should build in a regular review cycle along with our curriculum review to reassess our students' physical activity preferences. This will help us with class scheduling. Since living expenses were such a source of stress, we need to consider including financial wellness in our health lecture classes to facilitate the use of instrumental support (financial aid, Condor care).

We should consider professional development for the department faculty on the pedagogy of teaching coping strategies. Fostering collaborations with student services (EAC, Counseling) can help develop a symbiotic relationship. It is important to discuss with counseling the benefit of partnering physical activity classes with stress-inducing classes like math and science. Specifically, there is an opportunity to build on the Summer Scholars program for incoming freshman being piloted this summer. Since math is one of the major stressors for students, partnering a math class with a physical activity class for next year's Summer Scholar program could help alleviate the stress associated with taking a math course.

For our students, culture and racial/ethnic issues may evolve as a stressor for those who transfer to a university with a different composition of diversity. To prepare for the transition, transfer advocates can help the students prepare to leave the homogeneity of the campus community.

Our physical activity course curriculum can be revised to include course content that directly instructs about the benefits of exercise on stress and anxiety and positive coping strategies. Adding student learning outcomes in which students assess how participating in the physical activity class influences their stress and anxiety would help students measure this benefit. Since financial concerns are such a source of stress, the health education curriculum could be revised to add financial wellness into the course content.

To reduce the general education units needed for transfer to universities, the California State Senate has recently passed AB928. This change puts courses in Area E: Lifelong Learning and Self-Development, such as physical activity and health education, at risk. The findings of this study support how the benefits of physical activity classes extend into aspects of mental wellness and academic stress.

Future Exploration (Slide 11)

If this is the benefit of an online walking/running class, then how does a yoga, volleyball, or weight training class compare? We need to explore other modalities of exercise to gather evidence of their benefits. We want to dive deeper into the relationships of coping mechanisms and anxiety. Remember that there are both positive and negative ways of coping. Understanding if there are relationships between certain coping and symptoms of anxiety can help us develop more targeted curriculum. We need to learn more about what our students know about physical activity and exercise. Understanding their level of physical literacy will help us have a better idea of their knowledge and understanding of why physical activity is important and its resulting benefits. Again, this can help us update our curriculum and pedagogy to facilitate the development of healthy attitudes and habits.

We need to see if these results persist across different environments. Encouraging these opportunities is even more important for students set to transfer to our main feeder school because it does not have a kinesiology program or any physical activity classes. Sports, recreation, and physical activity are fun, but they aren't JUST fun. They build community, connection, teach skills, and directly benefit health. Over the long-term, we need to take steps towards gaining support to promote physical activity on campus through recreational facilities, such as a fitness center, and to develop an integrated mental health counseling and physical activity program with the student health center.

CHAPTER III: ACTION PLAN

The findings of this study will help assess the influence of college physical activity courses as a constructive coping mechanism in promoting mental wellness. This knowledge can be especially helpful for higher education institutions, especially those serving marginalized populations of community college students that struggle with higher rates of anxiety due to cultural and socioeconomic stressors.

A better understanding of specific stressors, coping mechanisms, and exercise preferences will help inform culturally-competent programs, curriculum design, availability of sport, physical activity courses, recreation, and support services to promote mental health effectively at an HSI. Outcomes from the study will directly inform college program reviews, the physical activity course curriculum, and the availability of courses in the schedule.

Initial Goals

At the college level, the findings will be presented to physical activity course instructors, administrators, student health center workers, academic counseling, and the associated student government. The findings will be tied into curriculum updates to adapt the courses to explicitly discuss the mental health benefits of participation. The positive mental health benefits will also be included rationale for the development of an outdoor fitness center.

The outcomes will be shared at the college's professional development sessions and regionally through the California Community College Physical Education Kinesiology and Dance (CCCPEKD) organization and the Southwest chapter of the American College of Sports Medicine (SWACSM) to inform institutions with similar student populations. I will submit my proposals to the professional development committee in spring 2022 and to the CCCPEKD and SWACSM in the summer of 2022. To help advocate maintaining the Area E: Lifelong Learning

and Self-Development courses in the implementation of the California Senate Bill AB928, a summary of the findings will be presented to the CCCPEKD to demonstrate the role of physical activity courses in promoting student mental health.

Long-Term Focus

Over the long-term, future steps will be towards gaining support to promote physical activity on campus through recreational facilities, such as a fitness center, and to develop an integrated mental health counseling and physical activity program with the student health center. In Spring 2022, a presentation to the transfer work group will share how culture and racial/ethnic issues may evolve as a stressor for those who transfer to a university with a different composition of diversity. This work group proposed the development of a peer transfer advocate program in which the peer transfer advocates support students as they prepare to leave the homogeneity of the campus community.

Over the summer of 2022, the Student Services department will be approached to discuss how the Summer 2023 Summer Scholars program for incoming freshman can partner a math class with a physical activity class to help alleviate the stress associated with taking a math course. Beginning in the fall of 2022, courses that come up in the curriculum review cycle will add course content relative to the mental health benefits of the modality and student learning outcomes to measure mental wellness. Physical activity course curriculum will be revised to include course content that directly instructs about the benefits of exercise on stress and anxiety and positive coping strategies. Adding student learning outcomes in which students assess how participating in the physical activity class influences their stress and anxiety could help students measure this benefit. The health education curriculum will also be revised to include strategies for managing financial stress.

Significant findings will be disseminated to professional journals, such as Research Quarterly for Exercise and Sport, Physical Educator, Journal of American College Health, Journal of Hispanic Higher Education, Community College Journal of Research and Practice, and Building Healthy Academic Communities Journal.

Future Research

Given the results of this study highlight the benefit of walking and running physical activity classes on reducing anxiety and academic stress, more investigation is warranted to evaluate whether this persists in other modalities. Further research will delve deeper into how a variety of physical activity courses, recreation, and sports can promote mental health in HSI community college student populations considering other factors, such as activity tracking, physical literacy, and relationships between coping strategies and anxiety levels. Ongoing research will include collaboration with other community colleges and universities to evaluate if the benefit of participation in physical activity classes reduces stress and anxiety in other environments and populations.

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APPENDIX A: INFORMED CONSENT

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: The influence of physical activity courses on stress and anxiety in students at a Hispanic-serving community college

Principal Investigator and Faculty Advisor:
Dianne Frehlich (PI) and Diane Gill (Faculty Advisor)

Participant's Name: _____

What are some general things you should know about research studies?

The purpose of this study is to utilize the information collected during the PE R143/146; KIN R140/141; HED R101 class assignment for future research purposes. As part of these courses, you will complete the Beck Anxiety Inventory, Godin Leisure-Time Exercise Questionnaire, Perceived Stress Scale, Brief COPE, and a survey with ratings and open responses about stress as a class assignment. For this study, I am requesting your permission to use your responses to these surveys as data for my study. Specifically, we are interested in information about you and your health including demographic information, psychological health, and exercise behavior.

Your participation is voluntary meaning that you decide whether the information you provide for this class project can be used for this intent.

You are being asked to participate in this research project because you are enrolled in PE R143/146; KIN R140/141; HED R101 and have/will complete the required assignment. You must be 18 years or older to participate.

In order to participate in this study, you will need to provide permission to the principal investigator. By signing this consent form, you are agreeing that your data from the class assignment can be used for this research study.

Is there any audio/video recording?
No.

How long will you keep my information?
Your de-identified data will be kept indefinitely and may be used for future research without your additional consent.

How will you keep my information confidential?
All information obtained by this study is strictly confidential unless disclosure is required by law. Information collected by this study, including demographic information and questionnaires, will be kept confidential. Only the primary investigator and advisor will have access to the data.

Only available to the primary investigator and advisor, data will be collected through Qualtrics® and uploaded to SPSS Statistics 25. Each participant will be randomly assigned an identification number. In the circumstance that the principal investigator is also the instructor, the principal investigator will not know who agreed to participate in the study until after final grades are submitted.

Survey data collected will be tracked by the assigned random identification number and coded into SPSS for data analysis by the primary investigator. No names will be listed. The username and password-protected data will be accessible only to the primary investigator and advisor. Data from this study may be used in reports, presentations, and publications. After the participants receive their random identification number, the master list that temporarily links names to study identification numbers will be destroyed.

Qualtrics Security Statement
Qualtrics' most important concern is the protection and reliability of customer data. Our servers are protected by high-end firewall systems and scans are performed regularly to ensure that any vulnerabilities are quickly found and patched. Application penetration tests are performed annually by an independent third party. All services have quick failover points and redundant hardware, with backups performed daily.

Access to systems is restricted to specific individuals who have a need to know such information and who are bound by confidentiality obligations. Access is monitored and audited for compliance.

Qualtrics uses Transport Layer Security (TLS) encryption (also known as HTTPS) for all transmitted data. Surveys may be protected with passwords. Our services are hosted by trusted data centers that are independently audited using the industry-standard SSAE-18 method.

What are the risks to me?
There is a minimal risk of a breach of confidentiality. You will be asked to complete questionnaires that assess your perceptions of stress and anxiety. This may lead to feelings of distress. Access to the college counseling services will be available for mental health care, if needed, through the student health center.

If you have questions, want more information, or have suggestions, please contact Dianne Habring-Frehlich who may be reached at dmhabrin@uncg.edu, or Diane Gill, faculty advisor, at dgill@uncg.edu.

If you have any concerns about your rights, how you are being treated, concerns or complaints about this project, or benefits or risks associated with being in this study please contact the Office of Research Integrity at UNCG toll-free at (855)-251-2351.

Are there any benefits to society as a result of my taking part in this research?
If you allow your data to be used for research purposes, the knowledge obtained in this study may help us learn more about the factors that influence college students' health behaviors in

everyday life. This may help in developing new programs and policies to promote wellness in young adults.

Are there any benefits to *me* for taking part in this research study?
There are no direct benefits to participants.

What if I want to leave the study?
You have the right to refuse to participate or to withdraw at any time, without penalty.

Your grade in PE R143/146; KIN R140/141; or HED R101 will not be affected by whether or not you allow your data to be used for research purposes. The principal investigator in this study will have no knowledge of whether or not you allowed your data to be used for research purposes until after final grades are posted for PE R143/146; KIN R140/141; or HED R101.

If you choose to withdraw your consent to allow the research team to use your data, you may request that any of your data that has been collected be destroyed. The investigators also have the right to stop your participation at any time. This could be because you have had an unexpected reaction, have failed to follow instructions, or because the entire study has been stopped.

What about new information/changes in the study?
If significant new information relating to the research project becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

Voluntary Consent by Participant:
By signing this consent form, you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing to consent to take part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate in this study described to you by Dianne Habring-Frehlich.

Signature: _____ Date: _____

APPENDIX B: COURSE OUTLINE

Walking for Fitness

This course is designed to provide exercise and fitness training for the walking student population. Emphasis is on cardiovascular conditioning and muscle strength, and endurance related specifically to walking. It is designed for students to participate in and achieve a more strenuous physical activity program.

Course Objectives:

Upon successful completion of this course, the student should be able to:

A. Identify and discuss the knowledge and skills necessary for a sound walking/overall training conditioning/fitness program. These include cardiovascular endurance, muscular endurance, muscular strength, flexibility, body composition, and weight control.
B. Demonstrate and practice the knowledge and skills necessary for a sound walking/overall training conditioning/fitness program.
C. Identify and discuss good walking techniques, proper clothing for different weather and
D. climate, shoes, and safety.
E. Discuss and apply knowledge of good nutrition as it relates to the needs of the person
F. participating in a physical fitness/exercise program vs. a weight control program.

Course Content:

Topics to be covered include, but are not limited to:

A. Knowledge of appropriate clothing for the weather, climate, and walking safety.
B. Proper walking techniques to avoid injuries.
C. Ability to find, take and record resting, target, and recovery heart rates.
D. Identify muscles of the human body related to walking
E. Elements of a physical fitness program and how to individually evaluate the following: cardiovascular endurance, muscular endurance, muscular strength, flexibility, and body composition.
F. Develop a progressively developmental physical fitness individualized program including the short-range goals, warm-up, warm-down, intensity, and duration of training.
G. Elements of nutrition and the nutritional needs of the human body are involved in exercise programs.
H. Develop a good nutritional plan with their exercise and weight control program addressed.

Lab Content:

A. Training programs
    a. Pace and tempo training
    b. Speed training
    c. Strength training
B. Terrain and environmental conditions
    a. Stairs
    b. Track
    c. Off-campus

C. Competition and time trials
    a. Cardiovascular VO2 calculation

Running for Fitness

This course is designed to provide exercise and fitness training for the moderate to active jogging or running student population. Emphasis is on cardiovascular conditioning and muscle strength, and endurance related specifically to jogging and running. It is designed for students to participate in and achieve a more strenuous physical activity program.

Course Objectives:

Upon successful completion of this course, the student should be able to:

A. Identify and discuss the knowledge and skills necessary to develop a sound running fitness program. These include cardiovascular endurance, muscular endurance, muscular strength, flexibility, body composition, and weight control.
B. Demonstrate and practice the knowledge and skills for a sound running fitness program.
C. Identify and discuss good running techniques, proper clothing for different weather and climate, shoes, and safety.
D. Discuss and apply knowledge of good nutrition as it relates to the needs of the person participating in a high-intensity physical fitness program.
E. Determine an effective intensity for various training goals and abilities.

Student Learning Outcomes:

A. Students will lower BMI - measured through electro-impedance body fat analyzer.
B. Students will lower body fat percentage - measured through body composition analysis.
C. Students will learn how to set up an appropriate walking/jogging/running program to improve their cardiovascular-pulmonary systems.
D. At the end of the semester, students will be able to complete a three-mile walk within an hour.
E. At the end of the semester, students will acquire knowledge to establish a healthy nutritional plan for better living.

Course Content:

Topics to be covered include, but are not limited to:

A. Identify safety procedures for class
B. Establish the importance of proper shoes and clothing
C. Testing & Evaluation
    a. Pretest
    b. Post-test
D. Physiology of Running
    a. Identify proper running form to improve performance
    b. Establish a method for measuring proper target heart rate
E. Identify muscle groups used when running/jogging
F. Mental aspects of running
G. Nutritional Guidelines
H. Warm-up, stretching, and cool down
I. Progression into racing

Lab Content:

A. Training programs
    a. Pace and tempo training
    b. Speed or interval training
    c. Distance or aerobic training
    d. Strength training
B. Terrain and environmental conditions
    a. Stairs
    b. Track
    c. Off-campus
C. Competition and time trials
    a. Cardiovascular VO2 calculation
    b. Designing progressive training programs for beginners to advanced runners interested in various distances

APPENDIX C: STRESSOR QUESTIONNAIRE

Participant #_____

Pre-, Mid-, Post-program
After the Brief COPE Inventory
Open Response Question: How do you usually deal with stress? List up to three ways.

Stressor Questionnaire
Please rate the frequency of the stress, anxiety, or worry you felt over the past month about the following topics on a scale from 1-5.
1 = *Not at all worried/tense* 2=A little worried/tense 3 = Moderately worried/tense 4=Very worried/tense 5=Extremely worried/tense

Education/Academics …….... 1 2 3 4 5
What about Education/Academics makes you feel stressed?

Finances/Resources ……...…... 1 2 3 4 5
What about Finances/Resources makes you feel stressed?

Family/Relationships……...…. 1 2 3 4 5
What about the Family/Relationships makes you feel stressed?

Culture/Racial-Ethnic Issues
What about the Culture/Racial-Ethnic Issues makes you feel stressed?

COVID-19 Pandemic…….……. 1 2 3 4 5
What about the COVID-19 pandemic makes you feel stressed?

Please how often you used PA/exercise to deal with stress over the past month on a scale of 0-4.
1=*Never* 2=*Rarely* 3=*Sometimes* 4=*Frequently* 5=*Always*

How often do you use PA/exercise to deal with stress …….1 2 3 4 5

What type of physical activity do you prefer when you are feeling stressed and anxious? (select all that apply)
Walking/Jogging/Running Weight Training Martial Arts Boxing Yoga Pilates Stretching High-Intensity Interval Training Tai Chi Boot Camp Dancing Hiking Team Sports (soccer, basketball) Individual Sports (tennis, golf) Swimming/Water Sports Surfing Bicycle Riding Cardio Machines Aerobics Skiing/Snowboarding Zumba

Pre-Program
Age_____
Race/Ethnicity (mark all that apply)

- ❑ American Indian or Alaska Native.
- ❑ Asian.
- ❑ Black or African American.
- ❑ Hispanic or Latino.
  - ❑ Mexican
  - ❑ Central American
  - ❑ South American
  - ❑ Puerto Rican
  - ❑ Other _____
- ❑ Native Hawaiian or Other Pacific Islander.
- ❑ White/Caucasian.
- ❑ Other _____

Gender (circle): Male Female Other_____ Prefer not to state

Status in School (circle): Full-time Part-time High School Dual Enrollment

Year in School (circle): 1st year 2nd year More than 2 years Non-degree seeking

Years attending college (circle): 1 2 3 4+

Are you taking any other physical activity classes? (circle): Yes (if yes, which one) No

Why did you register for this class? (select all that apply)
Degree requirement Try something new Participate in physical activity Be held accountable to exercise Improve Fitness Other_____

Post-Program
Please how much the course helped you deal with stress and anxiety on a scale of 1-5.
1=*Not at all* 2=*A little* 3=*Somewhat* 4=*Very much* 5=*A great deal*

How much did this course help you deal with stress and anxiety?... 0 1 2 3 4 5
How did the course help you deal with stress and anxiety?

Think about your experience in this physical activity class. Rate on a scale of 1-5 how much this course has helped you with the following:
1=*Not at all* 1=*A little* 2=*Somewhat* 3=*Very much* 5=*A great deal*

To increase stamina ……..……..	1	2	3	4	5
To relieve stress……...……...	1	2	3	4	5
To improve your mood……...……..	1	2	3	4	5
To boost energy……..……..	1	2	3	4	5
To improve quality of sleep……..	1	2	3	4	5
To increase your social life…….……..	1	2	3	4	5

APPENDIX D: PARTICIPANT DEMOGRAPHICS TABLE

Demographics
Demographics by Group

	Physical Activity	Lecture	Total
Age			
18-20	38	50	88
21-24	21	21	42
25-29	12	8	20
30+	19	5	24
Mean	25.14 yr ± 8.83[1]	21.32 yr ± 4.63[1]	23.3 yr ± 7.35[1]
Median	21	20	20
Gender			
Female	81	56	137
Male	33	39	72
Transgender	1		1
Other/Prefer not to state	2	3	5
Status in School			
Full Time	77	66	143
Part Time	30	30	60
Other/Prefer not to state	10	2	12

Note. n=215 (117 Physical Activity, 98 Lecture), [1]Data are presented as *M* ±SD

APPENDIX E: PARTICIPANT RACIAL AND ETHNIC BACKGROUND TABLE

Racial and Ethnic Backgrounds
Racial and Ethnic Backgrounds by Group

	PA	Lecture	Total
Mexican	80	73	153
White/Caucasian	16	8	24
Asian	5	7	12
Black or African American	4	3	7
Central American	5	2	7
Native Hawaiian or Pacifica Islander	3	1	4
Other Spanish/Hispanic/Latino origin		2	2
American Indian/Alaska Native		1	1
Other/Prefer not to state	4	1	5
Total	117	98	215

Note. n=215

APPENDIX F: STRESSOR DESCRIPTIVE STATISTICS TABLE

Stressors

Mean Scores for Stressors from Stressor Questionnaire

Topic	Physical Activity	Lecture	Total
Education/Academic[1]			
Pre	3.21 ±1.24	2.84 ±1.15	2.99 ± 1.31
Mid	2.99 ±1.31	2.97 ±1.20	2.98 ± 1.26
Post	2.91 ±1.26	3.17 ±1.13	3.02 ± 1.21
Finances/Resources[2]			
Pre	2.78 ±1.35	2.82 ±1.28	2.80± 1.32
Mid	2.81 ±1.45	2.68 ±1.28	2.76± 1.38
Post	2.70 ±1.37	2.72 ±1.18	2.71± 1.29
Family/Relationships[3]			
Pre	2.51 ±1.36	2.37 ±1.46	2.45 ± 1.40
Mid	2.22 ±1.13	1.98 ±1.03	2.12 ± 1.10
Post	2.29 ±1.30	2.30 ±1.16	2.29 ± 1.24
Culture/Racial-Ethnic[4]			
Pre	1.92 ±1.21	1.91 ±1.14	1.92 ± 1.17
Mid	1.67 ±.98	1.47 ±.71	1.58 ± .87
Post	1.64 ±1.00	1.60 ±1.03	1.62 ± 1.01
COVID-19 Pandemic[2]			
Pre	2.73 ±1.36	2.81 ±1.16	2.76 ± 1.27
Mid	2.46 ±1.24	2.51 ±1.31	2.48 ± 1.27
Post	2.51 ±1.25	2.26 ±1.03	2.40 ± 1.16

Note. [1]*n*=135 (77 Physical Activity, 58 Lecture) [2]*n*=131 (74 Physical Activity, 57 Lecture) [3]*n*=134 (77 Physical Activity, 57 Lecture); [4]132 (75 Physical Activity, 57 Lecture); Data are presented as *M* ±SD

APPENDIX G: STRESSOR MIXED ANOVA TABLE

Stressor Questionnaire Statistical Analysis
Mixed ANOVA

Topic	df (numerator, denominator)	*F*	*p*	η^2
Education/Academic[1]				
Time	(2, 266)	0.18	0.83	0.001
Group	(1, 133)	0.06	0.81	0.00
Time x Group	(2, 266)	4.02	0.02*	0.03
Finances/Resources[2]				
Time	(1.84, 237.18)	0.51	0.58	0.00
Group	(1, 129)	0.01	0.91	0.00
Time x Group	(1.84, 237.18)	0.48	0.61	0.00
Family/Relationships[3]				
Time	(1.77, 232.92)	5.00	0.01*	0.04
Group	(1, 132)	0.45	0.50	0.00
Time x Group	(1.77, 232.92)	0.70	0.48	0.01
Culture/Racial-Ethnic[4]				
Time	(1.74, 226.18)	11.53	<.001*	0.08
Group	(1, 130)	0.27	0.60	0.00
Time x Group	(1.74, 226.18)	0.79	0.44	0.01
COVID-19 Pandemic[2]				
Time	(1.90, 244.88)	7.83	<.001*	0.06
Group	(1, 129)	0.05	0.82	0.00
Time x Group	(1.90, 244.88)	1.65	0.20	0.01

Note. [1]*n*=135 (77 Physical Activity, 58 Lecture) [2]*n*=131 (74 Physical Activity, 57 Lecture) [3]*n*=134 (77 Physical Activity, 57 Lecture); [4]132 (75 Physical Activity, 57 Lecture); Data are presented as *M* ±SD *p<.05 = significant difference

APPENDIX H: DESCRIPTIONS OF STRESSORS TABLE

Descriptions Of Stressors

Frequency Of Stressor Themes from Qualitative Open Response Questions

Topic	Pre	Mid	Post	Total
Education/Academic				
Academics	80	66	62	208
None	14	35	44	93
Future	14	13	9	36
Life Balance	9	3	2	14
Finances/Resources				
Living Expenses	71	59	53	183
No Worries	32	50	55	137
Education	7	4	6	17
Family	5	2	1	8
Economics	2	2	2	6
Family/Relationships				
No Worries	37	56	56	149
Emotional Needs	45	37	37	119
Responsibilities	13	10	10	33
Health	15	8	8	31
Social Needs	7	6	6	19
Culture/Racial-Ethnic				
No Worries	71	84	90	245
Prejudice/Racism	27	21	16	64
Inequality	15	9	10	34
Violence	4	3	1	8

Topic	Pre	Mid	Post	Total
COVID-19 Pandemic				
No Concerns	34	56	56	146
Health/Death	40	30	24	94
Lifestyle	20	14	20	54
Social	16	9	12	37
Economics	7	8	5	20

Note. Frequencies calculated from grouped open responses categorized into themes. *n*=117

APPENDIX I: STRESSORS OPEN RESPONSE THEMES

Topic Area

Theme	*Category*
Education/Academics	
None	No worries
Academics	Time management, due dates, procrastination, completing course work, homework,
	Grades, passing, failing, not understanding the material, tests
	Specific subjects: Science and Math
	Course term length, online classes, school from home
Future	Transferring, graduating, finishing school, future plans
Life Balance	School/life/work balance, mental health, enjoying life, access to transportation
Finances/Resources	
Education	Paying for school, student debt
Family	Being single parent, helping parents
Global	Inflation/Price Increases, economy, COVID
Living Expenses	Living expenses, inability to afford necessities, not enough money to live independently
	Lack of savings, how to start saving
	Lack of work, reduced hours, unemployment, extra hours
	Debt: car, credit cards
	Unexpected expenses
	Managing money, budgeting
No Worries	Nothing, no financial worries
Family & Relationships	
Emotional	Not enough quality time with loved ones
	Family arguments, drama, conflicts, getting along
	Lack of emotional support
	Emotionally distant, growing apart
	Problems, everything
Health	Worried about children getting COVID
	Sick grandparents
	Family health issues, death
	Worried about if family and loved ones are ok
No worries	Happy, all is good, no worries
Responsibilities	Meeting family expectations, making everyone happy

Topic Area	*Theme*	*Category*
		Responsibilities for younger siblings
		Single parenting
		Parenting
	Social	Family lives far away
		Socializing after COVID
		Cultural expectations, attitudes, machismo
		Isolation
Culture/Racial Ethnic Issues		
	Inequality	Deportation
		Racial inequality
		National/global issues in society with race
	No worries	None, nothing, all is ok
	Prejudice/Racism	Prejudice, skin color, language, discrimination
		Racism, stereotyping
		Not feeling accepted
		Machismo/machista
		Extremists, white supremacists
	Violence	Violence around race, hate crimes
COVID-19 Pandemic		
	Economics	Work: extra, not enough, job loss, working online
		National, global impact, deaths, finance
	Health/Death	Death, Children without parents, loss of loved one, grief, not being prepared for death
		Transmission, health of self, children, parents, loved ones, getting COVID
		Vaccine: Vaccine Mandate, vaccine won't work
		Mental Health
	Lifestyle	People not following guidelines/taking the pandemic seriously, anti-vaxxers
		Uncertainty
		Duration, waves, variants, changing precautions
	No worries	No concerns
	Social	Returning to pre-COVID ways, being in public
		Lockdown, isolation, changing protocols
		Pre-COVID life, life will never go back to normal
		Children going to school

APPENDIX J: BRIEF COPE DESCRIPTIVE STATISTICS TABLE

Brief COPE
Mean Scores for Adaptive and Maladaptive Coping Strategies

Coping Strategy	Physical Activity	Lecture	Total
Use of Emotional Support[1]			
Pre	4.29 ±1.78	4.16 ±1.89	4.24 ±1.82
Mid	4.36 ±1.89	4.31 ±1.70	4.34 ±1.81
Post	4.67 ±2.11	4.40 ±1.74	4.56 ±1.96
Positive Reframing[1]			
Pre	5.42 ±1.61	5.15 ±1.81	5.31 ±1.69
Mid	5.22 ±1.65	5.02 ±1.80	5.14 ±1.71
Post	5.28 ±1.83	5.00 ±1.73	5.17 ±1.79
Acceptance[1]			
Pre	5.42 ±1.46	5.51 ±1.56	5.46 ±1.51
Mid	4.88 ±1.67	5.49 ±1.62	5.14 ±1.67
Post	5.24 ±1.67	5.33 ±1.61	5.28 ±1.64
Religion[1]			
Pre	4.26 ±1.93	3.96 ±1.96	4.14 ±1.94
Mid	4.05 ±2.12	4.16 ±2.07	4.10 ±2.09
Post	4.15 ±2.16	4.04 ±2.10	4.11 ±2.13
Humor[1]			
Pre	4.54 ±2.16	4.20 ±2.24	4.40 ±2.19
Mid	4.19 ±2.00	4.24 ±2.24	4.41 ±2.19
Post	4.22 ±2.11	4.36 ±1.99	4.26 ±1.99

Coping Strategy	Physical Activity	Lecture	Total
Active Coping[1]			
Pre	5.59 ±1.47	5.56 ±1.70	5.58 ±1.56
Mid	5.37 ±1.47	5.64 ±1.38	5.48 ±1.43
Post	5.42 ±1.58	5.53 ±1.49	5.47 ±1.54
Planning[1]			
Pre	5.72 ±1.64	5.64 ±1.79	5.68 ±1.69
Mid	5.24 ±1.77	5.44 ±1.72	5.32 ±1.75
Post	5.29 ±1.80	5.47 ±1.70	5.37 ±1.75
Use of Instrumental Support[1]			
Pre	4.22 ±1.85	3.91±1.91	4.09 ±1.87
Mid	4.23 ±1.98	4.25 ±1.97	4.24 ±1.97
Post	4.74 ±2.08	4.25 ±1.78	4.54 ±1.97
Self-Blame[2]			
Pre	4.95±2.08	4.74 ±1.90	4.86 ±2.00
Mid	4.36 ±2.01	4.48 ±1.91	4.41 ±1.94
Post	4.40 ±1.94	4.40 ±1.72	4.40 ±1.84
Venting[2]			
Pre	3.90 ±1.41	3.78 ±1.44	3.84 ±1.42
Mid	3.77 ±1.56	4.12 ±1.55	3.92 ±1.56
Post	3.95 ±1.79	3.91 ±1.42	3.91 ±1.41
Behavioral Disengagement[2]			
Pre	3.29 ±1.55	3.14 ±1.49	3.22 ±1.52
Mid	3.30 ±1.46	3.34 ±1.60	3.32 ±1.51
Post	3.04 ±1.28	3.22 ±1.39	3.12 ±1.33

Coping Strategy	Physical Activity	Lecture	Total
Substance Abuse[2]			
Pre	2.53 ±1.31	2.57 ±1.20	2.55 ±1.26
Mid	2.48 ±1.33	2.71 ±1.59	2.58 ±1.45
Post	2.43 ±1.18	2.74 ±1.33	2.56 ±1.25
Denial[2]			
Pre	3.13 ±1.43	2.97 ±1.45	3.06 ±1.43
Mid	3.05 ±1.50	2.84 ±1.35	2.96 ±1.44
Post	3.05 ±1.38	2.91 ±1.22	2.99 ±1.31
Self-Distraction[2]			
Pre	5.96 ±1.67	5.90 ±1.35	5.93 ±1.54
Mid	5.40 ±1.74	5.84 ±1.40	5.59 ±1.61
Post	5.43 ±1.78	5.74 ±1.48	5.56 ±1.66

Note. Brief COPE. The higher the score, the more frequently used (1=*I haven't been doing this at all*; 4=*A little bit*; 6=*A medium amount*; 8=*I've been doing this a lot*); Data are presented as *M* ±SD; [1]Adaptive Coping *n*= 133 (78 Physical Activity Class, 55 Lecture) [2]Maladaptive Coping *n*= 135 (77 Physical Activity Class, 58 Lecture).

APPENDIX K: BRIEF COPE MIXED ANOVA TABLE

Brief COPE Questionnaire Statistical Analysis
Mixed MANOVA

Coping Strategy	Wilks's Λ	df (numerator, denominator)	*F*	*p*	η^2
Adaptive[1]					
Time	0.91	(16, 510)	1.49	0.10	0.05
Group	0.95	(8, 124)	0.83	0.58	0.05
Time x Group	0.96	(16, 510)	0.67	0.82	0.02
Maladaptive[2]					
Time	0.91	(12, 522)	2.18	0.01*	0.05
Group	0.97	(6, 128)	0.75	0.61	0.03
Time x Group	0.96	(12, 522)	0.96	0.49	0.02
Problem-Focused[1]					
Time	0.93	(8, 518)	2.28	0.02 *	0.03
Group	0.96	(4, 128)	1.21	0.31	0.04
Time x Group	0.98	(8, 518)	0.55	0.82	0.01
Emotion-Focused[3]					
Time	0.91	(12, 526)	2.19	0.01*	0.05
Group	0.98	(6, 129)	0.47	0.83	0.02
Time x Group	0.95	(12, 526)	1.05	0.40	0.02
Avoidant[2]					
Time	0.96	(8, 526)	1.38	0.20	0.02
Group	0.97	(4, 130)	0.91	0.46	0.03
Time x Group	0.97	(8, 526)	0.94	0.49	0.01

Note. [1]*n*= 133 (78 Physical Activity Class, 55 Lecture); [2]*n*= 135 (77 Physical Activity Class, 58 Lecture); [3]*n*= 136 (78 Physical Activity Class, 58 Lecture);*p<.05 = significant difference

APPENDIX L: PERCEIVED STRESS SCALE ANOVA TABLE

Perceived Stress Scale Statistical Analysis

Mean Perceived Stress

	Physical Activity	Lecture	Total
Pre	23.91 ±5.74	22.86 ±6.33	23.46 ±6.00
Mid	22.23 ±5.90	22.08 ±7.26	22.17 ±6.50
Post	20.68 ±6.09	21.22 ±6.97	20.90 ±6.46

Note. n=138 (78 Physical Activity Class, 60 Lecture); Perceived Stress Scale. The higher the score, the greater the perceived stress (0= never to 40 =Very Often); Data are presented as *M* ±SD

APPENDIX M: POST-PROGRAM FEEDBACK INDEPENDENT T-TEST TABLE

Post-program Course Feedback Statistical Analysis
Independent t-Test

Coping Strategy	df	*t*	*p*
Reduce Stress & Anxiety	(151)	1.43	0.15
Increase Stamina	(150)	3.27	0.001*
Relieve Stress	(150)	1.70	0.09
Improve Mood	(110.65)	2.60	0.01*
Boost Energy	(150)	3.95	<.001*
Improve Quality of Sleep	(150)	.31	0.76
Increase Social Life	(150)	-1.46	0.15

Note. n= 152 (86 Physical Activity Class, 66 Lecture); **p*<.05 = significant difference

APPENDIX N: POST-PROGRAM FEEDBACK OPEN RESPONSE THEMES

Group *Theme*	*Category*
Physical Activity	
Stress Management	Learned how to release stress effectively, showed how to exercise helps relieve stress, made me realize I needed to release stress, taught me exercise can release stress, walking can be a tool for mental health.
Accountability	This held a form of accountability, motivated me, forced me to exercise, got me out walking, made me take time to get outdoors, I walk more than the assignments, just getting me outside, encouraged me to exercise, got me up and exercising, helped and motivated me to move a lot.
Physical Benefits	Release of energy, helped me use up my nervous energy, working out helped, always felt better after exercise, energized my mind, gave me more energy.
Distraction	Kept my mind busy, exercising took my mind off things, moving let's you concentrate on the moment, helped me stay calm and focused, getting a break from classes, helped me catch a break.
Mindfulness	This was a way to help me focus on something for me, making time for myself, learned to appreciate getting out by myself, a reminder to check in on myself.
Health Lecture	
Awareness	Made me more aware of mental health to help me deal appropriately, opened my eyes, educated me about how stress affects the body, learned more about stress, learned about the signs, helped me understand the root of the problem, made me realize what to work on.
Resources	Gave me resources, was given information, reminded me what outlets and options are available, used some of the resources.
Coping	Learned how to cope, helped me understand what methods I could use, gave me ideas of what I can do to release stress, taught me tactics, showed me healthy ways to cope, helped me rethink how I deal with stress.
Connection/Expression	It was nice to learn what others are going through, helped me express myself and my emotions better, acknowledged me, finding out I am not the only one who feels this way, sharing my answers relieved my stress.

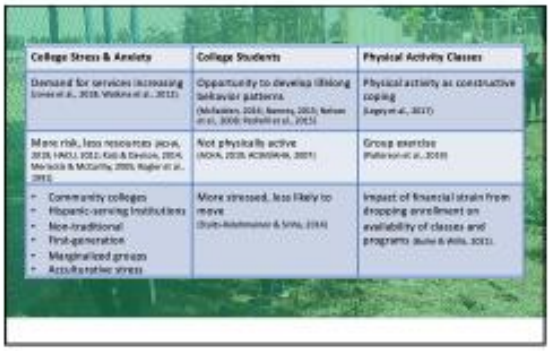
APPENDIX O: COURSE TERM LENGTH MIXED MANOVA TABLE

	df (numerator, denominator)	*F*	*p*	η^2
Perceived Stress Scale[1]				
Time	(2, 266)	10.99	0.001	0.08
Group	(1, 133)	0.04	0.84	0.00
Time x Group	(2, 266)	0.66	0.52	0.005
Time x Term Length	(4, 266)	0.57	0.67	0.01
Time x Group x Term Length	(2, 266)	0.86	0.42	0.01
Group x Term Length	(1, 133)	0.12	0.73	0.001
Beck Anxiety Inventory[2]				
Time	(1.97, 275.58)	5.81	.004	0.04
Group	(1, 140)	0.38	0.54	0.003
Time x Group	(1.97, 275.58)	1.24	0.29	0.01
Time x Term Length	(3.94, 275.58)	0.23	0.92	0.003
Time x Group x Term Length	(1, 140)	0.30	0.59	0.002
Group x Term Length	(1.97, 275.58)	0.25	0.78	0.002

Note. [1]*n*= 138 (78 Physical Activity Class, 60 Lecture); [2]*n*= 145 (85 Physical Activity Class, 60 Lecture);*$p<.05$ = significant difference

APPENDIX P: DISSEMINATION PRESENTATION

1



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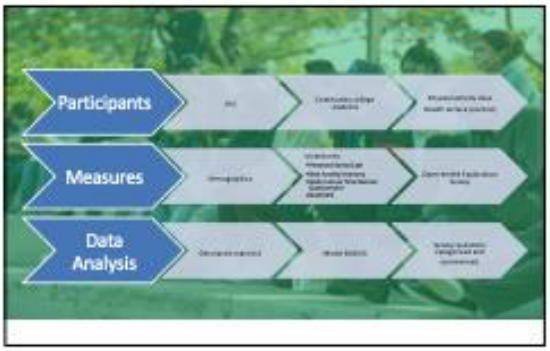

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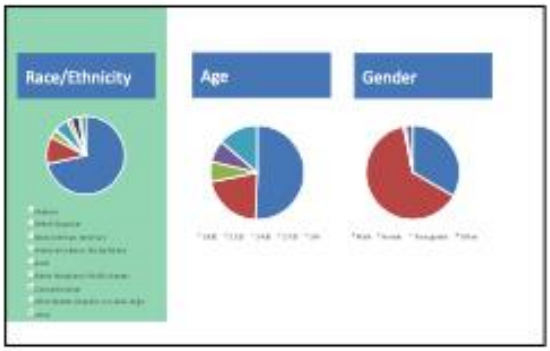

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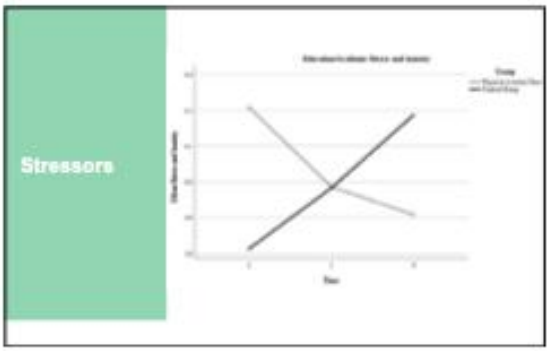

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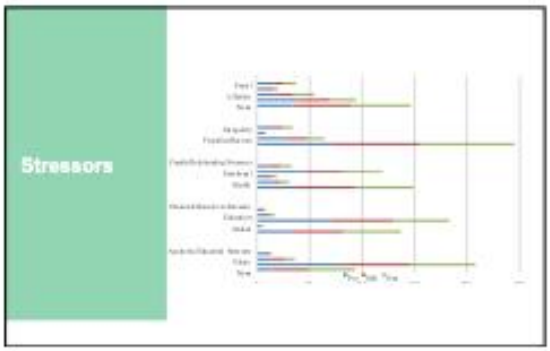

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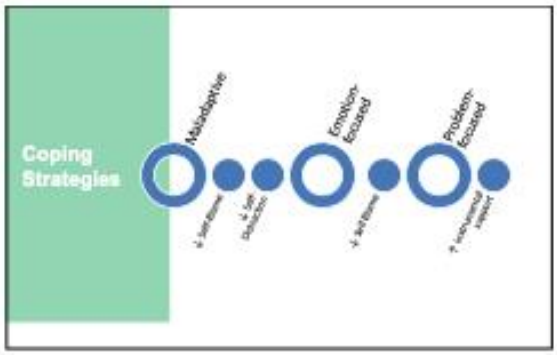
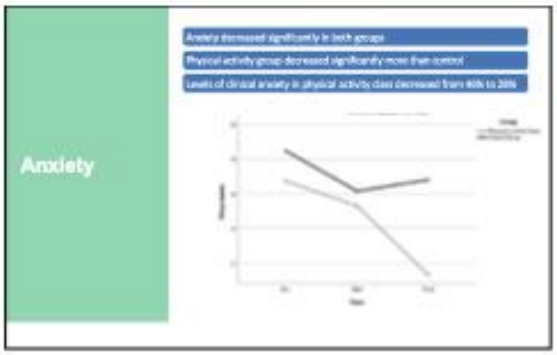

Coping Strategies
Maladaptive
Emotion-focused
Problem-focused

7


Anxiety
Anxiety decreased significantly in both groups
Physical activity group decreased significantly more than control
Levels of clinical anxiety in physical activity class decreased from 46% to 28%

8


Sources of Stress

9


Professional Implications

10


Future Exploration
Modalities
Relationship of coping/anxiety
Physical literacy
Environment

11

California Community Colleges

PHYSICAL EDUCATION KINESIOLOGY DANCE

Physical Activity Courses

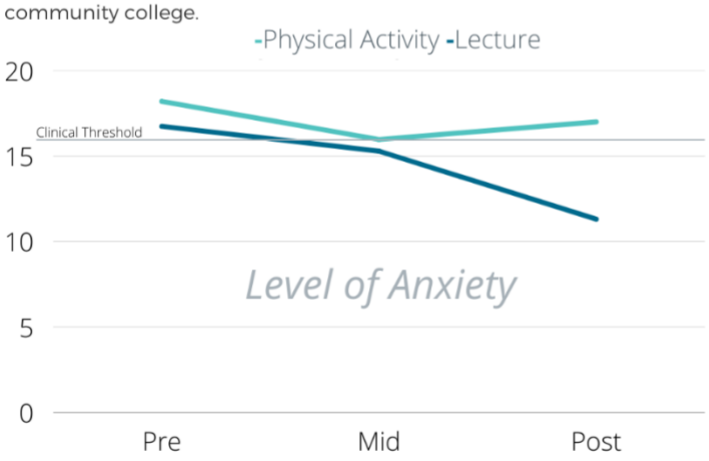
Reduce Anxiety

in HSI-Community College Students

Dianne Habring-Frehlich dmhabrin@uncg.edu

INTRODUCTION

Over a third of college students suffer from anxiety and high stress. Though physical activity is known to have mental health benefits, 50% of college students do not meet the American Heart Association physical activity recommendations. Since chronically underfunded Hispanic-serving institutions (HSI) are struggling to meet the mental health needs of their students, physical activity classes can play a role in teaching healthy long-term behaviors that promote mental wellness. This mixed methods study evaluated the influence of college physical activity courses on the stress and anxiety of students at an HSI community college.



METHODS

Students (n=215) enrolled in a physical activity course and a health lecture class completed pre-, mid-, and post-program surveys to assess stressors (Stress and Anxiety Questionnaire), coping strategies (BriefCOPE), stress (Perceived Stress Scale, PSS), and anxiety (Beck Anxiety Inventory, BAI-II).

IMPLICATIONS

- Revise Curriculum to include:
  - Coping strategies
  - Mental health SLOs
- Collaborate with student services
- Modify class schedules
- Develop recreational programs that promote physical activity.
- Less stressed and anxious students = improved student success

RESULTS

Education/Academic Stress

- ↑ lecture group
- ↓ physical activity class

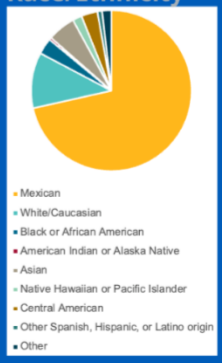
Coping Strategies

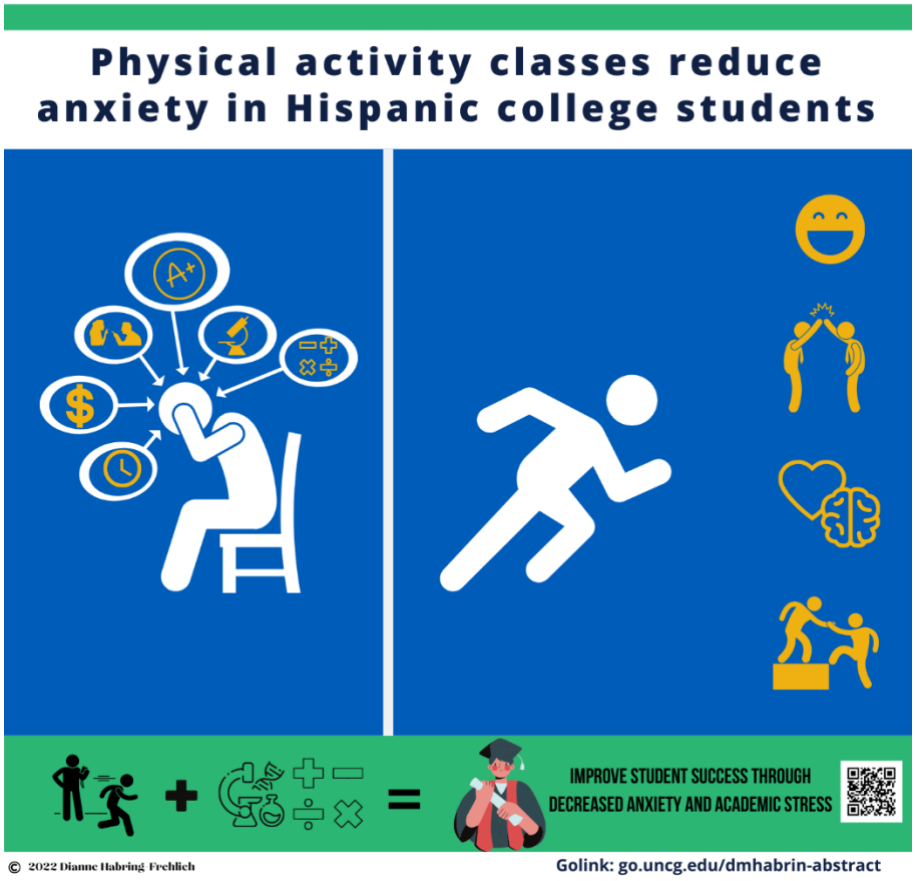
- ↓ maladaptive
- ↑ use of instrumental support

Anxiety

- ↓ both groups
- Group differences
  - Physical activity group ↓ more than lecture group.
- Post-program means
  - Physical activity ↓ clinical threshold
  - Lecture ↑ clinical threshold

Race/Ethnicity




Physical activity classes reduce anxiety in Hispanic college students
A+
$
IMPROVE STUDENT SUCCESS THROUGH DECREASED ANXIETY AND ACADEMIC STRESS
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