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# The Effects of Physical Activity Classes on Stress in College Students

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## ABSTRACT

**Background:** While stress is unavoidable, many college students face overwhelming levels of stress and lack proper stress management skills. Increased levels of stress can lead to poor mental and physical health as well as poor academic performance. **Objective:** To examine the differences in stress levels of students of different racial backgrounds who participate in for-credit vs. recreational physical activity (PA) classes. **Methods:** Participants (n=53) completed a survey composed of open-ended questions about stress and stress management, as well as the short-version International Physical Activity Questionnaires (IPAQ). **Results:** Because of limited sample size, no significant differences were found between students who were participants in recreational classes vs. for-credit classes. There were also no significant differences in stress levels between students from different racial backgrounds. However, results indicated that students who participated in recreational PA classes had a higher stress level entering class than students participating in for-credit PA classes. However, both types of PA classes lowered student stress levels. **Conclusion:** Data suggests that compared to students in for-credit PA classes, students participating in recreational PA classes may be doing so for the purpose of stress management and may be more aware of the benefits of PA in regards to stress management.

## LITERATURE REVIEW

College students encounter many stressors including social relationships, concerns about future career opportunities, economic standing, and academic performance on a daily basis (Çivitci, 2015). Overall, 12% of college students perceive their stress levels as high, and 75% of college students perceive their stress levels as moderate (Çivitci, 2015). According to Jahan (2016), stress results when a person does not believe in their ability to cope with their stressors (Jahan et al., 2016). Transitioning and adjusting to a new environment can prove to be very difficult for many students. College students need as many outlets as possible for coping with daily stressors. Decreasing one's levels of stress through adequate stress management can improve an individual's overall education and academic performance. The present paper investigates the effects of physical education and recreational courses, as well as their various components—particularly the types of physical activity and socialization—on the stress levels of college students. This topic is important because health in college students is an increasing concern as curricula and

responsibilities become more demanding. Also, the college campus learning environment is the ideal time to explore stress management. Learning stress management techniques early increases the chances of them becoming habits and following a person throughout the rest of their life.

Stress can be defined as “environmental events or chronic conditions that objectively threaten the physical and/or psychological health and well-being of individuals of a particular age in a particular society” (Grant et al., 2003, p.462; Sharp & Barney, 2016). Students who are of racial minorities often deal with race-related stress in addition to the stress that the common student faces. Race-related stress is defined as “race-related transactions between individuals or groups and their environment that emerge from the dynamics of racism, and that tax or exceed existing individual and collective resources or threaten well-being” (Harrell, 2000, p. 45). Due to stressors such as discrimination, group conformity, and stereotype confirmation, there is an increased chance of minority students having higher stress levels (Chavez & French, 2007; Turner & Smith,

2015). Research shows that exercise is one of the most effective ways to reduce stress levels (Baghurst & Kelley, 2013; Bland et al., 2014). In a survey conducted by the American College Health Association, students indicated that stress had the most negative effect on their academic performance (American College Health Association [ACHA], 2009; Meier & Welch, 2016). Stress can lead to health conditions and mental health problems that can be avoided through sufficient stress management.

The daily stressors that college students face could have detrimentally negative impacts on their overall health. Increased levels of stress in college students can lead to mental health problems such as depression, anxiety, insomnia, and suicidal thoughts (Keyes, et al., 2012; Lang, et al., 2016; Meier & Welch, 2016). Surveys have shown that mental health disorders are steadily increasing in colleges with the number of students reporting symptoms between 30% and 50% (Blanco et al., 2008; Bland, et al., 2014; Hunt & Eisenberg, 2010). According to the American Psychological Association, stress also has negative impacts on blood pressure, blood sugar, and heart rate, and it can cause hypertension as well as hyperventilation (“Stress effects on the body”). In addition to the negative health effects of stress itself, students often deal with their daily stressors using coping methods that could cause even further damage to their health; some of these methods are using illegal drugs, smoking, and consuming alcohol (Byrne & Mazanov, 2003; Lang et al., 2016; Park, Armeli, & Tennen, 2004). If these coping behaviors are maintained throughout the student’s later years, it is likely that even more serious health problems will arise (Compas, et al., 2001; Lang et al., 2016). It is imperative that students receive education on positive ways to cope with stress. Exercising has shown to reduce anxious moods, lower depressive symptoms, and reduce mood deterioration in both subjects that suffer from psychological disorders and in normal subjects (Moses, et al., 1989; Norris et al., 1992; Salmon, 2001; Steptoe et al., 1989). Spontaneous physical activity in particular has been shown to have a positive impact on depression symptoms (Salmon,

2001). Providing exercise related coping mechanisms for college students could prove to be beneficial in counteracting poor overall health as well as poor mental health, and in reducing long-term risks (Lang, et al., 2016).

Physical activity classes are one of the most accessible ways for college students to deal with stress (Barney, Benham, & Haslem, 2014). A key study conducted by Barney, Benham, and Haslem in 2014 attempted to examine how students perceive the effects of physical activity courses on their life stressors. The study included classes of both individual and team sports: basketball, volleyball, bowling, racquetball, and tennis. The study found that physical activity courses positively affected stress in the lives of most students. Overall, students reported that the physical activity courses helped them to forget their stressors, have more ability to manage school responsibilities, and handle daily stressors; these same results occurred even when the student didn’t enroll in the course for the purpose of stress management (Barney, et al., 2014). This study is relevant and important because it provides concrete evidence that stress levels in college students are positively benefiting from physical activity courses. Physical activity courses are crafting physically and mentally healthier college students, while also aiding them in their studies (Barney, et al., 2014). As of 2014, only 39.6% of universities require students to take physical activity courses in order to earn a degree (Barney, et al., 2014). A similar key study investigated the perceived effects of physical activity classes on stress from students that went to a university that required physical activity courses and students that went to a university that did not require physical activity courses. This study included five different types of physical activity courses: water (swim), team (basketball, soccer, etc.), individual (bowling, golf, etc.), outdoor (archery, rock climbing, etc.), and fitness (yoga, weights, etc.). The only noticeable difference was why the students chose to enroll in the class. Students from the university that did not require physical activity classes were more likely to take the class in order to manage stress; students at the university where physical activity classes were

required were more likely to take the class solely because they needed the credits in order to graduate (Sharp & Barney, 2016). Nevertheless, the same results were found in this study as in the previous one: participation in physical activity classes helped students forget about and deal with stress, and students left class feeling less stressed than they felt when they arrived (Barney, et al., 2014; Sharp & Barney, 2016). This study is important because it adds to the literature by re-affirming previous research and providing evidence in support of physical activity classes in universities. The two key studies previously described contribute greatly to the research literature; however, they are limited because they only compare differences in gender. These studies are also limited because they are both looking at classes where students earn academic credits.

Current research is lacking in studying differences between races, and differences between structured and leisure physical activity classes. Things that we do not know yet are whether or not perceived stress in students differs based on whether they are enrolled in a credited physical activity class that results in earning credits towards their degree, and has requirements and structure that may place limitations on students; or a recreational physical activity class that does not have requirements and structure that places limitations on students. Also, we do not know whether or not these physical activity classes have a different effect on students of different races. Any noticeable differences will add to research literature and could provide evidence in favor of altering the types of classes, instructional methods, attendance requirements, etc. that are offered in physical activity classes at universities.

## **METHODS**

### *Participants*

College students enrolled at Winthrop University participated in this study (n=53). Winthrop University's Institutional Review Board (IRB) granted permission to conduct this research. Participants were active in either a for-credit or recreational physical activity class

located on campus. All participants were volunteers and at least 18 years of age.

### *Materials*

This study employed a modified version of the Physical Activity and Stress Survey developed in a previous research study (Barney, Benham, & Haslem, 2014). The survey was modified to include two questions identifying race/ethnicity, one question identifying whether the class was credited or recreational, a question identifying the name of the class, and seven questions from the International Physical Activity Questionnaires-Short Version (IPAQ). There were two other demographic related questions: one to identify sex and one to identify academic classification. There are eight open-ended questions and two Likert-scale questions (1=low; 2=medium; 3= high; & 4=very high) related to the physical activity classes and daily stress. Another question asked students to indicate how many physical activity classes they've participated in on campus. Validity and reliability have been determined from a previous study (Barney, Benham, & Haslem, 2014).

### *Procedures*

Researchers approached professors and instructors and gained permission to hand-out surveys either before (in for-credit classes) or after (in recreational classes) class, or surveys were completed online. Participants received information regarding the purpose, risks, and benefits of participating in the study. Participants were also made aware that participation was completely voluntary and that they had the right to withdraw from the study at any point. Surveys were then distributed to all students and participants were asked to answer each question completely. Students also received an information sheet containing researcher and Compliance Officer contact information, as well as the project's purpose, risks, benefits, and privacy. Students who did not wish to participate in the study were allowed to hand back blank surveys. Participants were thanked for their participation and told to contact the researcher if they had any questions or wanted any further information regarding the project.

### Data Analysis

T-tests were run to determine a difference in stress levels between for-credit and recreational physical activity classes. Descriptive statistics tests were used to determine the average amount of exercise from the IPAQ questions. IPAQ scoring protocol were used to determine the median MET—minutes/week and the level of physical activity for the population.

## RESULTS

### Demographics

A total of 53 students at Winthrop University have participated in this research project (n=53). The number of participants from the recreational classes (n=25) was one less than the number of participants from the for-credit classes (n=26). More females (n=44) have participated in this study than males (n=4). The majority of participants were in their junior academic year (n=24). Other academic years that have participated include freshmen (n=3), sophomores (n=4), seniors (n=15), and graduate students (n=5). Participating racial groups include white (n=23), black or African American (n=26), Hispanic (n=1), and multi-racial (n=3) students.

### Stress Ratings

Stress was examined using a Likert-scale rating from 1 to 4 (1=low, 2=medium, 3=high, 4=very high). In the survey, students were asked to rate their stress before [Q12] and after [Q13] their participation in their physical activity class. Out all of participating students, 47.06% rated their stress as medium (n=24) and 25.49% of students rated their stress as high before the class (n=13). There was a significant difference in these stress level ratings between for-credit and recreational classes. Students participating in recreational classes reported higher levels of stress coming into class than students participating in for-credit classes. Of the students who rated their stress as high before the class, 15.38% were participants in the for-credit classes (n=2) and 84.62% were participants in the recreational classes (n=11) (M= 1.9 +/- 0.9 vs. 2.5 +/- 0.7; p=0.011) [Figure 1]. There was no significant difference by race.

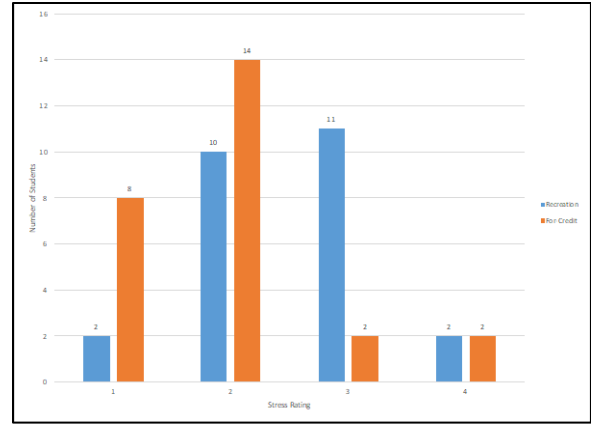


Figure 1: Stress ratings before class of students participating in recreational and for-credit PA classes.

Out of all participating students, 54.90% reported their stress level as low (n=28), 39.22% reported their stress level as medium (n=20), and 5.88% reported their stress level as high upon leaving the class (n=5). There was no significant difference in these stress levels between for-credit and recreational classes. There was also no significant difference in these stress levels by race [Figure 2].

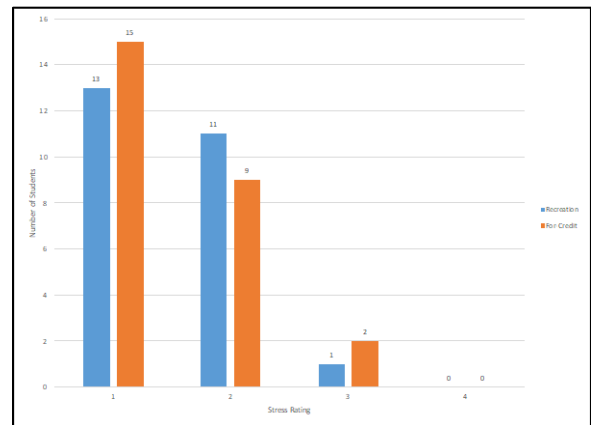


Figure 2: Stress ratings after class of students participating in recreational and for-credit classes.

IPAQ data showed that students participated in an average of 3.1 +/- 1.6 days of physical activity per week. This student population had a median MET—minutes/week of 1000 minutes, a 'moderate' physical activity rating according to IPAQ scoring protocol.

### *Stress Perceptions*

Eight open-ended yes/no questions were asked in the survey. Students were asked if participation in their physical activity class helped them to better accomplish their school responsibilities. Of all student participants, 50.98% claimed that it did (n=26), 13.73% claimed that it did not (n=7), and 35.29% of students claimed that it sometimes did (n=18). Of the students that claimed that it did help them better accomplish their school responsibilities, 42.31% were participants in for-credit classes (n=11) and 57.69% were participants in recreational classes (n=15). 50% of these students identified as white (n=13) and 50% of these students identified as a minority student (n=13). Of the students who claimed that it did not help them better accomplish their school responsibilities, 85.71% were participants in for-credit classes (n=6) and 14.29% were participants in recreational classes (n=1). 57.14% of these students identified as white (n=4) and 42.86% of these students identified as a minority student (n=3). Of the students who claimed that it sometimes helped them better accomplish their school responsibilities, 50% were participants in for-credit classes (n=9) and 50% were participants in recreational classes (n=9). 44.44% of these students identified as white (n=8) and 55.56% identified as a minority student (n=10) [Table 3]. One student who responded “yes” stated, “I feel like I have relieved some stress, and now I am able to focus on my school work.” One student who indicated “sometimes” stated, “Sometimes I dread going from a relaxed state after yoga back into studying or other school activities.”

Participants were asked if they feel they can better handle the stressors in their life after participating in their physical activity class. Of all student participants, 56.86% claimed that the class does help them better handle their stressors (n=29), 15.69% claimed that the class doesn't help them better handle their stressors (n=8), and 27.45% claimed that the class sometimes helps them better handle their stressors (n=14). Of the students who claimed that the class does help them better handle their stressors, 51.72% were participants in for-credit classes (n=15) and 48.28% were participants in

recreational classes (n=14). 51.72% of these students identified as white (n=15) and 48.38% of these students identified as a minority student (n=14). Of the students who claimed that the class doesn't help them better handle their stressors, 50% were participants in for-credit classes (n=4) and 50% were participants in recreational classes (n=4). 50% of these students identified as white (n=4), 50% of the students identified as a minority student (n=4). Of the students who claimed that the class sometimes helps them better handle their stressors, 50% were participants in for-credit classes (n=7) and 50% of students were participants in recreational classes (n=7). 42.86% of these students identified as white (n=6) and 57.14% identified as a minority student (n=8) [Table 3]. One student who answered “yes” indicated, “It is a healthy way to cope with stressors. It allows me to be stressed and essentially sweat it out!” Students who answered “sometimes” stated that it “depends on the stressors.”

Students were also asked if they took the class to help reduce or manage the stress in their lives. Of all participants, 41.18% said they did (n=21), 45.10% said they did not (n=23), and 13.73% said they sometimes did (n=7). Of the students who said they did take the class to help reduce or manage stress, 42.86% were participants in for-credit classes (n=9) and 57.14% were participants in recreational classes (n=12). 57.14% of these students identified as white (n=12) and 42.86% identified as a minority student (n=9). Of the students who said they did not take the class to help reduce or manage stress, 69.57% of students were enrolled in for-credit classes (n=16) and 30.43% of students were enrolled in recreational classes (n=7). Of these students, 39.13% identified as white (n=9), and 60.87% identified as a minority student (n=14). Of the students who said that they sometimes took the class to help reduce or manage stress, 14.29% were enrolled in for-credit classes (n=1) and 85.71% were enrolled in recreational classes (n=6). Of these students, 57.14% identified as white (n=4) and 42.86% identified as a minority student (n=3) [Table 3]. Students who answered “yes” indicated that the classes are “fun” and help them “feel more

relaxed.” Students who answered “no” indicated that they took the class to be active.

|   |              | Yes | No | Sometimes |
|---|--------------|-----|----|-----------|
| After participation in this physical activity class, I feel more able to accomplish my school responsibilities? | Recreational | 15  | 1  | 9         |
|   | For-Credit   | 11  | 6  | 9         |
|   | White        | 13  | 4  | 8         |
|   | Minority     | 13  | 3  | 10        |
| After participating in the class activities, I feel I can handle the stressors in my life?                      | Recreational | 14  | 4  | 7         |
|   | For-Credit   | 15  | 4  | 7         |
|   | White        | 15  | 4  | 6         |
|   | Minority     | 14  | 4  | 8         |
| Did you take this class to help reduce or manage the stress in your life?                                       | Recreational | 12  | 7  | 6         |
|   | For-Credit   | 9   | 16 | 1         |
|   | White        | 12  | 9  | 4         |
|   | Minority     | 9   | 14 | 3         |

Figure 3: Stress perception responses of students according to class type (recreational and for-credit) and racial background (white and minority).

### CONCLUSIONS & DISCUSSION

Data trends are showing that all physical activity classes (both for-credit and recreational) are helping students effectively lower their stress levels. There was a difference in stress levels coming into class between students participating in for-credit classes and those participating in recreational physical activity classes. More students participating in recreational classes indicated that they took the class to help them manage or reduce their stress. This data suggests that more students who participate in the recreational PA classes may be more aware of the effects that PA can have on stress. Universities should use this information to make efforts towards educating their students on the benefits that all PA and the PA classes that may be offered on campus can have in terms of stress management in order to make students more aware of the healthy options they have for managing their stress levels.

Data trends are also showing that recreational students may be benefitting more from their physical activity classes than for-credit students. More students from recreational physical activity classes are claiming that their classes help them handle their school and life stressors better and that they take the classes specifically for those reasons. This data suggests that the participants in recreational PA classes find the classes to be more enjoyable than for-credit PA classes and believe that they are more effective at relieving stress. This may be because the for-credit PA classes come with attendance

requirements and physical and written assessments, which are not a component of recreational PA classes. Data shows no differences in stress levels between races, meaning that PA classes are effective at lowering stress levels regardless of racial background.

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