

The Relationship between Exercise and Depression in First Year College Students

Melissa Santander

Queens University of Charlotte

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Abstract

In 2013, 31.8% of undergraduate college students were so depressed that they found it hard to function. College health centers are finding an increased usage of the counseling services. First year undergraduate students have high levels of depression, because of the increased stress with the transition to college. Could increasing exercise have an inverse effect on depression in the first-year college-aged student? First-year college students in a small university in the southeastern United States participated in a health survey. They were surveyed on their frequency, length of time and level of exercise; in another question they were asked “have you ever felt so depressed that it was difficult to function?” Sample size was 167 students (40% of the first year class). Using their answers about exercise for the independent variable and their answer about depression for the dependent variable, a multiple regression analysis was completed. There was no correlation between the frequency, length of time and level of exercise and their level of depression. Exercise is an effective treatment for depression, and the effects are lasting, not only for the post exercise period. Also, exercise improves overall health and well-being. Further research needs to be done to evaluate the relationship of exercise and depression. Students could be referred to a treatment group from the counseling center and random volunteers could also participate in a six-month exercise intervention program. Their pre and post- intervention depression levels would be evaluated for an inverse relationship of exercise and depression.

TABLE OF CONTENTS**CHAPTER I: INTRODUCTION**

Introduction.....4

Theoretical Framework.....5

CHAPTER II: REVIEW OF LITERATURE

Review of Literature.....7

Depression in Traditional Undergraduate Students.....7

Exercise and Depression.....8

CHAPTER III: METHODOLOGY AND PROCEDURE

Methodology and procedure.....10

CHAPTER IV: RESULTS

Results.....12

Demographics.....12

Analysis.....13

CHAPTER V: DISCUSSION

Limitations.....15

Discussion.....15

Sample Demographics Table.....14

Acknowledgments.....16

Appendix A: IRB Approval.....17

REFERENCES.....18

The Relationship between Exercise and Depression in First Year College Students

CHAPTER I**Introduction**

Depression during the college years has been well documented. According to the American College Health Association (ACHA) national survey of college students (2013), 31.8% of undergraduate students during the previous year were so depressed they found it hard to function. A total of 59.6% of surveyed undergraduate, college students “felt very sad” within the last year and during the previous year 83.7% of students “felt overwhelmed by all they had to do” (American College Health Association [ACHA], 2013). The first year of traditional undergraduate education has the highest rate of depression in the college-aged population. Depression is one of the top impediments to academic success. Depression is a risk factor of suicide. According to the CDC (2012), suicide is the third leading cause of death in the fifteen to twenty-four year old age group.

While these statistics are alarming there is hope. The standard of care for depression is antidepressants and psychotherapy in combination. This combined approach has been found to be effective in most depression cases. The medications have side effects, which are offensive to the patient causing the patient to stop the medication (Eyre, Papps, & Baune, 2013; Nahas & Sheikh, 2011). Seeking counseling at the university health center can also be difficult for students; some students feel there is a stigma in being seen in the university counseling center (Yorgason, Linville, & Zitzman, 2008). Medications and psychotherapy may be beneficial, but that might be only part of the solution.

Exercise has been shown to be beneficial in the treatment of depression. Could increasing exercise or physical activity levels have a preventative effect on depression?

College health nurses are often the first contact a student has in the treatment of their depression. At the university health center, one of the most important jobs of the nurse is to recognize and facilitate treatment of depression and anxiety. Nurses who are equipped with multiple, varied treatment options will be successful in helping the student deal with their psychological distress. Thus, better understanding of the relationship between exercise and depression is paramount for assembling a holistic approach for students presenting with depression.

Theoretical Framework

Self-Determination Theory was selected as the theoretical framework supporting this study. The theory addresses motivation; what motivates and maintains change in behavior. Self-Determination Theory looks at personal motivation or internal motivation. Three factors autonomy, competence, and relatedness, will maintain positive behavior change. Individuals strive for a sense of wellbeing, but the presence of these three factors is important in maintaining this sense of wellbeing. External rewards can influence positive behavior change, but cannot maintain that behavior. Internal motivation is necessary to maintain behavior change (Ryan & Deci, 2000).

Springer, Lamborn, and Pollard (2013) showed that maintenance of physical activity over time was influenced by the intrinsic factors of competence, autonomy, and relatedness. This study showed that group support (relatedness), competence, and the ability to control when and what exercise was performed, increased the ability of participants to maintain physical activity. The feeling of competence and seeing themselves as physically active increase adherence to the physical activity. "Health and life mastery" increased maintenance of physical activity (Springer, Lamborn, & Pollard, 2013, p.290). Another study looked at maintenance of physical

activity during the transition from high school to college, it found that only intrinsic motivation was beneficial in the maintenance of physical activity during this transition (Ullrich-French, Cox, & Bumpus, 2012).

The idea of autonomy is important in the college-aged student. A study of happiness in college students found that having control over one's life and behaviors added to their feelings of well-being and happiness, although having negative thoughts about oneself can mediate these feelings of well-being. The opposite is true that having happy thoughts without autonomy does not lead to happiness and a sense of well-being. A sense of control seems to be a key component to happiness (O'Donnell, Chang, & Miller, 2013). The research shows intrinsic motivation is necessary to maintain a positive change; the behavior needs to bring a sense of well-being, competence, and control (O'Donnell, Chang, & Miller, 2013).

Self-Determination Theory may explain why some students come to college with the motivation to be physically active. This theory helps the university staff plan ways to implement exercise programs for the psychological and physical well-being of the students. When implementing an exercise program for physical and psychological health of students, it would be important that the activity brought pleasure to the students, so they would be motivated to continue the exercise program. Exercise programs need to be tailored to the students' level of fitness, so they could feel competent. Also the student should have input as to the activities that would be involved in the program, so they could feel a sense of control over their own well-being.

CHAPTER II

Review of Literature

A search of EbscoHost using the keywords, depression and exercise and college-aged students revealed 28,384 articles. Based on the date of publication, quality of research and age specific data, eighteen articles were selected for this literature review.

Depression in Traditional Undergraduate Students

Based on the ACHA national survey of college students (2013), 10.7% of college students had been diagnosed or treated by a professional for depression in the last year; in the last year, 46.5% of students felt that things were hopeless, and 60.5% felt very sad. According to the ACHA (2013) survey, depression was one of the top impediments to academic success.

There are no ethno-racial differences in levels of depression in undergraduate college students (Herman et al., 2011). Development of depression in college is multifactorial, including family history, financial constraints, roommate/friend issues, and academic concerns (Aselton, 2012)

College life and in particular the first year of college seems to be fraught with these stressors that can lead to depression and suicidal ideations. ACHA listed depression as an impediment to academic success (American College Health Association, 2012). First year undergraduate students have high levels of depression, because of the increased stress with the transition to college. First year students have new financial stress, living on their own for the first time, and not being with their support system. The freshman year has been shown to be stressful, and with novice coping mechanisms, the first year students are susceptible to depression (Brandy, 2011). A study looking at counseling center utilization for second semester, first-year college students at two commuter colleges in a large metropolitan area in the northeast,

showed that 74% of these first-year students were in moderate psychological distress (Rosenthal & Wilson, 2008).

College-aged students can enter college with mental health issues and some students have mental health issues arise while they are in college (Douce & Keeling, 2014). Studies have shown that college-aged students' "emotional health has been declining over time" (Eagan, et al., 2014). Students with decreased mental health will often access care through the university health center. Universities have seen an increase in usage of counseling services and students are finding they have to wait to receive care (Eagan, et al, 2014). Students have less social connectedness and decreased social connectedness is related to increased depression (Armstrong & Oomen-Early, 2009). One of the factors affecting social connectedness is decreased time socializing with peers and increased time on social media websites (Eagan, et al, 2014).

Exercise and Depression

The American Heart Association (2013) recommends that adults should engage in 30 minutes of moderate intensity, aerobic, physical activity five or more times per week or vigorous intensity, physical activity for 25 minutes three or more times per week for health benefits. According to the ACHA national survey (2013), 48.8% of college students are getting their recommended amount of physical activity for optimum health, this includes college athletes. College students do see exercise as a way to cope with the stress of college (Aselton, 2012). Studies have shown that if the good habit of exercise is started in the college years it is likely to continue on after college (Kozak, Nguyen, Yanos, & Fought, 2013).

Physical activity has long been shown to increase positive feelings; endorphins are released, and there is a euphoric feeling that lasts after the physical activity is completed. Runners refer to this as a "runners high". While exercise can promote positive feelings, is it an

effect treatment for depression? Many studies have examined exercise as an effective treatment for depression in conjunction with other prescribed therapies. Exercise is an effective treatment for depression, and the effects are lasting, not only for the post exercise period. Also, exercise improves overall health and well-being (Blake, Mo, Malik, & Thomas, 2009; Blake, 2012; Callaghan, Khalil, Morres, & Carter, 2011; Carta et al., 2008).

Some of the studies reviewed incorporating group exercise. These studies questioned if the decrease in depression in these studies was solely the exercise or the relatedness of the participants. Social interaction may have been related to the positive changes in depressive symptoms (Callaghan et al., 2011; Searle et al., 2011). The inter-relatedness of the group physical activity helped with starting to exercise and maintaining exercise over time (Springer et al., 2013). Increase in social isolation contributed to depressive symptoms in college-aged population. Student athletes, who had more physical activity and increased social support through their team interactions had lower levels of depression (Armstrong & Oomen-Early, 2009).

Participants in a randomized controlled trial studying the effectiveness of exercise on depression, were asked their opinions (Searle, et al, 2011). Most of the participants in this qualitative study stated that exercise was an effective therapy for depression, and it allowed for a level of control by the patient. The subjects felt they were helping to manage their depressive symptoms. These same participants also noted the other many benefits of exercise, such as improving sleep, fitness, body image, and sense of well-being.

Study authors have also examined the college-aged population; depression, suicide, and exercise. The research has demonstrated that increased exercise has an inverse effect on depressive symptoms and suicidal ideation (Dinger, Brittain, & Hutchinson, 2014; Elliot,

Kennedy, Morgan, Anderson, & Morris, 2012; Taliaferro, Rienzo, Pigg, Miller, & Dodd, 2009). The studies done with undergraduate college students echo the findings of other studies done with different age groups. Studies that were focused on undergraduate populations also highlight the other benefits of physical activity such as improving health and well-being. One aspect of physical activity and depression brought forth in the undergraduate population is the level of depression and exercise. Increased depression limited the drive to exercise thus limited the effectiveness of the exercise intervention. The motivation to exercise is missing at higher levels of depression (Leventhal, 2012).

The review of the literature revealed that the college-aged population is experiencing higher levels of depression and that exercise is an effective treatment for depression, either alone or as an adjunctive therapy, depending on the level of depression. Among the many benefits from exercise, decreased depression, increased sense of well-being, and increased coping ability, offer an option to college-aged students suffering from the stressors of college life. Healthy Campus 2020 set forth objectives for students based on the government initiative Healthy People 2020. One of the overarching goals of the initiative is “Promote quality of life, healthy development, and positive health behaviors” (American College Health Association, 2012). Based on this goal from Healthy campus 2020, it would be important to examine the relationship between depression and exercise in the first year college student.

CHAPTER III

Methodology and Procedure

Institutional Review Board approval from Queens University of Charlotte was granted in spring 2013 for the initial National College Health Assessment (NCHA) survey administration. The spring, 2013 survey was administered to the entire undergraduate student body. For this

retrospective study, an additional Institutional Review Board exempt application was completed and approved by Queens University of Charlotte (Appendix A).

Using the data gathered from the initial survey, the hypothesis for the present study was that level of exercise has an inverse relationship to depression in the first year college student. If the hypothesis is supported, then there is an assumption that exercise has a prophylactic effect on depressive symptoms.

The ACHA –National College Health Assessment (NCHA) is a well-respected, nationally recognized health survey that collects information on health, behaviors and perceptions of the college-aged students. The survey was developed in 1998 and piloted in spring of 1998 and fall and spring semesters of 1999. The NCHA was first administered to a wide range of schools (35 postsecondary institutions) in spring of 2000. The reliability and validity of the survey was established by comparing the NCHA with The National College Health Risk Behavior Survey 1995 (CDC), The Harvard School of Public Health 1999 College Alcohol Study, The United States Department of Justice National College Women Sexual Victimization Study 2000 and the pilot ACHA-NCHA in 1998 and 1999. The NCHA survey was found to be reliable and valid in representing the college-aged student (ACHA-NCHA, 2014).

The NCHA data from a small liberal arts university in the southeastern United States was used to examine the relationship between exercise and level of depression in first-year college-aged students. The survey asks self-reported length of time, frequency and level of exercise. Length of time and levels of exercise are moderate-intensity for 30 minutes, vigorous-intensity for 20 minutes and strength training. Students indicate how many days a week they participate in each of these activities. The survey examines the self-reported depression in certain increments of time. The question for depression asks: Have you ever felt so depressed

that it was difficult to function? The answer choices are: no never; no, not in the last twelve months; yes, in the last two weeks; yes, in the last thirty days and yes, in the last twelve months (ACHA-NCHA, 2011).

A convenience sample of traditional undergraduate students in their first year of college was used for this study. The sample was racially diverse and included men, women and transgender students. Students received a letter via email explaining the NCHA survey and inviting them to participate in the health survey. The NCHA survey is a confidential, web-based survey, which can be accessed by the students from their email using a protected password. By accessing the survey via the secure website, students are communicating consent to participate in the survey. An ID number was assigned to each email so the secure internet server could manage the survey input. To ensure confidentiality, ID numbers and emails are destroyed before data were shared with the university.

The survey data were converted into an excel spread sheet and using the Analysis Toolpak a multiple regression analysis of the data was performed to identify a correlation between exercise and depression in first-year, traditional college-aged students. Participants with null values for either exercise questions or depression question were eliminated from analysis. Using exercise frequency, length of time and level as the independent variables and self-reported depression as the dependent variables, a multiple regression was used to analyze the data.

CHAPTER IV

Results

Demographics

Of the 171 first-year undergraduate students who participated in the survey, 167 students were included in the analysis, four students were excluded for not answering the questions on exercise or depression. Of the 167 first-year students ranging in age from 18 to 22, all were full-time students. 142 students lived in on campus housing, 24 students lived at home with parents or guardians and 1 student lived in other off-campus housing. 130 students were female, 34 students were male, one student was transgender and 2 students did not indicate gender. When asked how the students described themselves, they could choose more than one ethnoracial group. 108 identified as white; 34 identified as black; 24 identified as hispanic or Latino/a; 6 identified as Asian or Pacific Islander; 9 identified as American Indian, Alaskan native, or Hawaiian; 9 identified as biracial or multiracial; and 3 identified as other.

Analysis

Respondents reported an average of 3.86 days of moderate exercise, 4.44 days of vigorous exercise and 2.58 days of weight lifting. 28% of students are getting the American Heart Association recommended amount of moderate exercise. 49% of students are getting the AHA recommended amount of vigorous exercise. Of the first-year students included in our sample 118 denied any depressive symptoms for the last year and 49 respondents had some level of depression within the past year.

Excel Analysis Toolpak was used to perform a multiple regression analysis on the data supplied for the questions on exercise and depression. For students participating in moderate activity for 30 minutes the correlation with depression was -0.0787. For students participating in vigorous activity for 20 minutes the correlation with depression was -0.1059. For students participating in weight lifting the correlation with depression was 0.0033. There was no correlation between exercise and depression in this study.

Table 1. Sample Demographics

N=167	n	% of sample
Full-time	167	100%
Age		
18	94	56%
19	67	40%
20	2	0.01%
21	1	0.005%
22	1	0.005%
null	2	0.01%
Gender		
Female	130	77%
Male	34	0.20%
Transgender	1	0.005%
Null	2	0.01%
Race		
White	108	64%
Black	34	20%
Hispanic or Latino/a	24	14%
Asian or Pacific Islander	6	0.04%
American Indian, Alaskan, Hawaiian	9	0.05%
Biracial or multiracial	9	0.05%
Other	3	0.018%

CHAPTER V

Limitations

There are several limitations of this study. First the survey questioned self-reported level and frequency of exercise and level of depression. This could have resulted in biased reporting of data. Second, this study used a convenience sample of first-year undergraduate students, who for the most part did not suffer from depression (n=118, no depression). These students, on average, participated in some form of exercise from 2-5 days a week. Third, the data were only analyzed for first-year students. If the entire data set which included first-year through upper classman was used the results may have been different.

Discussion

Results of this study did not show a relationship between level and frequency of exercise and depression. Despite the body of evidence that shows exercise helps improve depressive symptoms, these data did not show a correlation between exercise and depression.

Other studies have shown that exercise can decrease depression. Further research needs to be done incorporating exercise as an adjunct therapy for depression. Students could be recommended to the study from the counseling center and students could also volunteer to participate. Students would participate in an exercise intervention for 6 months. Students would complete pre- and post-intervention surveys, which would ask questions about depressive symptoms. This data would be analyzed for an inverse relationship between exercise and depression. Following this study, an exercise program could be developed for incoming first-year students as a tool for coping with the transition to college.

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Appendix A. IRB approval



November 13, 2014

Melissa Santander
Presbyterian School of Nursing

RESEARCH PROTOCOL APPROVAL, IRB FILE # 11-14-PSO-0112

The Institutional Review Board reviewed your research request:

The relationship between exercise and depression in first year college students

Your protocol (11-12-14); Informed consent form, Focus group questions, Questionnaire; and Recruitment materials were approved for use within the facilities of Queens University of Charlotte. The Board determined your study poses minimal risk to subjects and meets the criteria for an exempt application. If you plan to use the protocol outside of Queens University of Charlotte, you may need to submit it to the IRB at that institution for approval.

This approval expires one year minus one day from date above. Before your study expires, you must submit a notice of completion or a request for extension. You are required to report any changes to the research study to the IRB for approval prior to implementation. This form can be found on the IRB site on MyQueens and should be sent to irb@queens.edu.

If we can be of further assistance, please do not hesitate to contact us. Please use the IRB file number when referencing your case.

Sincerely,

Laree Schoolmeesters

Laree Schoolmeesters, PhD, RN, CNL
Chair, IRB

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