

THE RELATIONSHIP BETWEEN EXERCISE AND MENTAL HEALTH IN COLLEGE STUDENTS



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Introduction

Depression, anxiety, and suicide are increasing on college campuses and continue to be two of the most common health problems that university students experience¹. In addition to rising anxiety and depression, college students are not getting enough physical activity to ensure health benefits. Forty to fifty percent of college students do not meet standard exercise guidelines². Low levels of activity are associated with risk for major health conditions, including psychological problems³. Low to moderately intense aerobic activity has revealed mental health benefits for exercise participants, in comparison to other forms of activity, including resistance training⁴.

Rationale

Finding alternative, cost-efficient, and easily implemented solutions to those suffering from anxiety and depressive symptoms was inspiration for this study as well as a lack of studies conducted on this topic with the college student population. Most of the research done with the connection between mental health and exercise have been conducted with older adult populations or the general public. This study extends results from previous studies with older populations. Counselors on college campuses, faculty and staff, as well as exercise professionals and anyone working with college students can benefit from the findings of this research study.

Research questions

1. Will participants vary in their self-reported ratings of anxiety and depression before and after the completion of an exercise program?
2. Will participants' attitudes towards exercise and readiness to change occur during the course of the study?
3. How much physical change will occur in this exercise program according to body fat and cardiovascular health?

Methods

The study explored changes in physical fitness and on self-reports of anxiety and depression symptoms before and after participating in a six-week exercise program at a Midwestern university.

Assessment tools that were used were the Burns' Anxiety and Depression Inventories and an Attitudes Towards Exercise Inventory. Quantifiable measures of physical fitness were assessed using the Tanita® Body Composition Analyzer, model TBF-300A-III for weight and body composition, and the Rockport walking test was used as a measure of cardiovascular fitness. Polar® heart rate monitors were used during the Rockport walk test to measure time and heart rate. Participants recorded their activity using a log provided.

Population

Participants consisted of 45 females and 30 males. Ages of participants ranged from 18-39. 90% were 18 – 21 years old and 10% were 23-39. 62 participants were Caucasian, 4 Asian, 5 Black, 4 participants chose not to respond, and 3 participants responded, 'other' which included 1 Somali and 2 of mixed race.

T-tests for Physical Characteristics							
	Control Pre Mean(Sd)	Treatment Pre Mean(Sd)	t-value	p-value	Control Post Mean(Sd)	Treatment Post Mean(Sd)	p-value
BMI	24.5020 (4.9326) (N=23)	24.6900 (4.6956) (N=22)	0.28	0.7837	24.3364 (4.7204) (N=44)	24.1764 (4.6957) (N=44)	0.14 0.8986
VO2	42.3910 (7.7948) (N=21)	41.8609 (7.2009) (N=20)	0.31	0.7536	45.5518 (8.4028) (N=30)	45.6371 (8.8181) (N=30)	1.26 0.2143
Body Fat	28.1800 (7.4075) (N=23)	28.4662 (8.1017) (N=22)	3.35	0.0013*	27.9391 (8.2572) (N=23)	28.7000 (8.5011) (N=44)	2.40 0.0191*

Note: *Significance level was set at p < .05

The control group started the study out with significantly higher body fat (28.3360 ± 7.8075) than the treatment group (28.4962 ± 10.3437), p=0.013. There was no significant difference in the categories of BMI and VO2 pre and post in the treatment group.

T-tests for Anxiety, Depression, and Attitudes Towards Physical Activity							
	Control Pre Mean(Sd)	Treatment Pre Mean(Sd)	t-value	p-value	Control Post Mean(Sd)	Treatment Post Mean(Sd)	p-value
Anxiety	14.7200 (12.1214) (N=23)	12.7185 (11.0912) (N=22)	0.63	0.5318	13.2278 (10.0000) (N=22)	13.0000 (9.6572) (N=44)	1.05 0.3086
Burns Depression	3.1680 (3.1028) (N=23)	4.3609 (6.2518) (N=22)	-0.79	0.4349	3.0602 (3.5741) (N=44)	3.6500 (3.9441) (N=44)	0.61 0.5497
Attitudes-Mental	4.0114 (3.2516) (N=23)	4.1122 (4.0377) (N=22)	-1.18	0.2418	4.0826 (4.4421) (N=44)	4.2996 (4.4421) (N=44)	-1.80 0.0763
Attitudes- Stages of Change	4.5521 (4.4207) (N=23)	4.5096 (4.3509) (N=22)	0.85	0.4028	4.4545 (4.4540) (N=44)	4.579 (4.4441) (N=44)	-1.10 0.2765

No significant difference between the groups is identified when comparing pre or post testing means in the categories of anxiety, depression, and attitudes of physical activity.

Paired t-tests for Treatment Group Physical Characteristics				
	Mean Difference	Sd	t-value	p-value
BMI (N=44)	-0.1750	0.7393	-1.57	0.1237
VO2 Max (N=38)	3.7039	5.7313	3.98	0.0003*
Tanita Body Fat (N=44)	-0.1659	1.6494	-0.67	0.5082

*Significance is set at p < .05.

Paired t-tests for Control Group Physical Characteristics				
	Mean Difference	Sd	t-value	p-value
BMI (N=23)	-0.0304	0.6335	-0.23	0.8199
VO2 Max (N=20)	0.7009	4.6244	0.69	0.5007
Tanita Body Fat (N=23)	-0.3130	2.3692	-0.63	0.5328



Paired t-tests for Treatment Group Survey Information				
	Mean Difference	Sd	t-value	p-value
Burns Anxiety (N=44)	3.3636	7.8625	2.84	0.0069*
Burns Depression (N=44)	1.7045	5.5430	2.04	0.0475*
Attitudes-Mental (N=43)	-0.1945	0.3688	-3.46	0.0013*
Attitudes- Stages of Change (N=43)	-0.0852	0.4881	-1.16	0.2531

*Significance is set at p < .05.

Paired t-tests for Control Group Survey Information				
	Mean Difference	Sd	t-value	p-value
Burns Anxiety (N=22)	1.9542	9.0841	1.01	0.3244
Burns Depression (N=22)	-0.3478	3.4590	-0.48	0.6344
Attitudes-Mental (N=22)	-0.0702	0.4132	-0.80	0.4341
Attitudes- Stages of Change (N=22)	0.0268	0.3929	0.68	0.5050

Results

Results indicated significant differences existed between pre and post scores for the treatment group that participated in the six-week exercise program in categories of anxiety, depression, attitudes/beliefs that exercise can improve mental health, and VO₂ max scores. Non-significant differences were found between pre and post data in the measures of body composition and BMI for the treatment group. In the control group no significant differences were noted in anxiety, depression, attitudes towards exercise, body fat, VO₂ max or BMI.

Discussion

University counseling centers, exercise professionals and others working with the college population have a valuable and influential opportunity to instill knowledge, skills, and positive beliefs about health in a crucial time of student's development when they are at greater risk for anxiety and depression. Results of this study can help inform professionals that exercise may serve as an additional tool in helping to moderate the effects of anxiety or depression affecting students, while providing additional positive health benefits to the students as well.

Limitations

Limitations may exist in the generalization of the findings of this study because of the convenient sampling method and the short duration of intervention. Future longitudinal research to assess changes over time may prove beneficial to further inform the body of research on this topic. Another consideration is that anxiety and depression may fluctuate at certain times throughout the semester or when the instruments were administered.

References

Burns LA, Beltramini JM, Tsang WC, Sweeney P, & Brown VL. (2001). Changes in counseling center client problems across 15 years. *Professional Psychology Research and Practice*, 10(4), 46-72.

Krause, N., Guan, J., Patten, J.C., & Braken, D.M. (2003). A meta-analysis of college students' physical activity behaviors. *Journal of American College Health*, 11(6), 116-122.

US Department of Health and Human Services. (2010). *Healthy people 2010: Understanding and improving health*, 2nd edition in two volumes. Washington, DC: Government Printing Office.

Blaylock M, Bhambhani JA, & Herman S. Khan, P., Derogatis, M., & Meese, R. (2000). Exercise treatment for major depression: maintenance of therapeutic benefit at 10 months. *Psychosomatic Medicine* 62: 633-638.