
INFLUENCE OF AEROBICS ON MODULATION OF DEPRESSION AND ANXIETY AMONG COLLEGE STUDENTS

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Abstract

Many college students have mental problems like depression or anxiety. This paper attempts to reveal the modulation effect of aerobics on depression and anxiety among college students. Based on the self-rating depression scale (SDS) and the self-rating anxiety scale (SAS), a questionnaire survey was conducted on 60 students. The survey data were analyzed on SPSS19.0. Then, the subjects were divided evenly into two groups. Only one of the two groups were asked to do aerobic exercise. Through the analysis on the experimental results, it is concluded that female students are more susceptible to depression and anxiety than male students; long-term and moderate aerobics can effectively relieve the negative moods of college students. Therefore, college students are suggested to participate in aerobic exercise to ensure their mental health. The research findings lay a theoretical basis for modulation of negative emotions of college students.

Key words: College Students, Aerobics, Depression, Anxiety.

Received: 26-02-19 | Accepted: 17-06-19

INTRODUCTION

Today, dramatic development of social culture and economy and the advancement in technology has changed individuals' thinking modes, world outlook, values and views of life, etc. (Nyer, Farabaugh, Fehling et al., 2013; Joiner, 1996; Kassel, Bornovalova, & Mehta, 2007). Mental health is a good psychological state of individuals. Those mentally healthy individuals have good adaptability, and active and optimistic attitude towards life so that they can adapt to and survive in the burgeoning social environment (Nelson & Gregg, 2012; Zhou, Zhu, Zhang et al., 2013). In the era of intellectual economy, not only should talents have professional skills and reserve profound knowledge, but they should also have a good physique and psychology, as well as high adaptability to society, positive attitude and interpersonal skills, etc. (Falsafi, 2016; Mejía &

Mccarthy, 2010; Minghelli, Morgado, & Caro, 2014).

College students are the major group of high-tech talents required in society. Their mental health should arouse common concern of society (Koohsar & Bonab, 2011a; Khubchandani, Brey, Kotecki et al., 2016). The existing studies have revealed that due to the pressures and setbacks from learning, interpersonal communication, emotions, employment, and huge psychological gaps, the students are prone to depression and anxiety during the process of studying and living (Posselt & Ketchen, 2016; Alzeghoul, Masten, Toy Caldwell-Colbert et al., 2001). Therefore, in the education work, in addition to the students' learning and career development, universities should also attach importance to the students' mental health, and foster their strain capacity in face of emergencies. Besides, it is proved in certain studies that sports or physical exercises are conducive to students' distraction from depression and anxiety and development of positive attitude (Lee, Jang, Park et al., 2013; Koohsar & Bonab, 2011b). However, some scholars have questioned about this. So, a

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further study should be conducted on the influence of physical exercises on the depression and anxiety.

Aerobics is an aerobic exercise in groups, as one of the popular sports at the university stage. Taking the aerobic exercise as an example, this paper aims to study the modulation effect of aerobics exercise on students' depression and anxiety symptoms. For this, using the questionnaire survey and mathematical statistics analysis method, it discusses the incidence of depression and anxiety among students, and compares the mental states of students with depression and anxiety before and after aerobics exercise. This study lays a theoretical foundation for effectively improving students' depression and anxiety.

RELEVANT THEORIES OF DEPRESSION AND ANXIETY

Definition of depression and anxiety

Depression refers to a downhearted, low, and persistent mood or mentality (Johnson, Vidal, & Lilly, 2018; Jenaro, Flores, & Frías, 2017). It is defined in an allowable range. Once the bound is breached, it means that a person falls in an abnormal emotional state, which is called as depression in medical field. In daily life, to the depression tendency is always manifested as some symptoms (Figure 1), including depressing emotion, lack of energy, inefficiency, decreased memory, slow response, fatigue, and drowsiness; their sleep quality and appetite are also badly spoiled. In extreme cases, some feel no sense in life, and even think of world-weariness or suicide. If the above symptoms or behaviors last over time for some persons, they can be considered as suffering from depression. For patients with depression in such state for a long time, they will have the bad moods such as anxiety, sadness, fear and guilt, ruining their interpersonal and normal life.

Anxiety is also a negative mood caused by many factors (psychological stress, physical health or external environment, etc.). As shown in Figure 2, those with anxiety are often accompanied by a chain of physical or physiological responses such as palpitations, hyperhidrosis, uneasiness, dizziness, and shortness of breath, and these adverse responses are easily ignored by themselves or the people around, further worsening their symptoms over time. It has been also found that women are more susceptible to anxiety and

uneasiness due to psychological stress and mental burden than the even-aged men.

Figure 1. Symptoms of depression

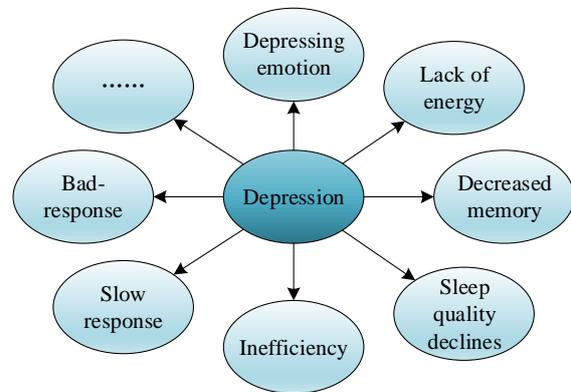
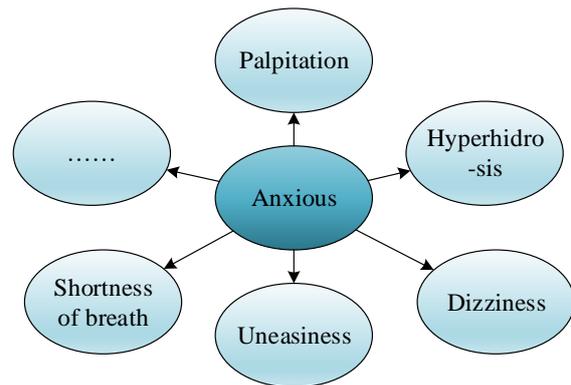


Figure 2. Symptoms of anxiety



Relevant studies have shown that depression and anxiety usually appear together, and interact to aggravate the adverse emotion or symptom, ultimately increasing the incidence of bad moods. In this case, when one has an emotion similar to depression or anxiety, he or she should seek help and medical treatment in time.

Relevant theories

Students have not yet shaped perfect world outlook and view of life at this stage in universities. They do not have accurate recognition of themselves so that they cannot effectively modulate or control their own behaviors and ideas. In face of setbacks or social inequity, they can easily develop a psychological gap. but if leaving it alone, it will further cause the growth of depression. Interpersonal relationship between students in universities is

more complex than before. Good interpersonal relationship and psychological state are helpful to students' growth and development in the new social circle, while the poor interpersonal relationship shall bring about bad emotions and promote depression or anxiety symptoms in them. In addition, students also are faced with different pressures from learning or employment etc., which may lead to unhealthy anxiety. Furthermore, they usually cannot find an effective way to respond to mistakes or problems. In the long run, if the bad emotions are not relieved in a timely manner, students' depression and anxiety shall be worsened, further affecting their physical and mental health.

Domestic and foreign scholars have proposed various analytical theories about the reasons and influence of depression and anxiety, mainly including the cognitive theory of depression, the behaviorism theory, the attribution theory and the psychoanalysis theory. The cognitive theory of depression believes that patients with depression tend to interpret their experience in a negative, abnormal way under the bad external or internal environment. This kind of negative attitudes and wrong cognition of society, surrounding environment, and the future cannot address the problems arisen, but adversely harm their own bodies. In the end, negative thoughts and depressed emotions interact to form a vicious circle and further develop depression. Behaviorism theory believes that depression and anxiety symptom is a process in which behavioral development yields results. It argues that the depression basically features the decrease of frequency for certain activities of the individuals, that is, they lose the faith and interests in all the people and things around under the influence of environment or adverse events. Attribution theory holds that those with depression usually attribute the occurrence of negative events to themselves, thus questioning their own personality and efforts and also reducing self-confidence. The psychoanalysis theory shows that depression is a response to loss of emotion and love, which leads to the incidence of depression symptoms.

INFLUENCE OF AEROBICS ON STUDENTS' DEPRESSION AND ANXIETY

Study method and test objects

This paper conducts a test to explore the influence of aerobics on students' depression

and anxiety symptoms. The test group includes 30 students, aged 20 -25, including 15 boys and 15 girls for one semester (20 weeks), and aerobics exercise was done twice a week, for 2h each time. The control group also includes 30 students, 15 males and 15 females, at the same age group, and there were no other physical exercises except for routine study and work. Two types of questionnaires, i.e. the self-rating Depression Scale (SDS) and the Self-rating Anxiety Scale (SAS) were set. The two groups finished the questionnaires before the test, after 10 weeks, and after 20 weeks, respectively. The scores were rated according to the scales using the SPSS19.0. According to the principle of statistics, T-test, X^2 test, repeated measures analysis of variance, etc., were performed to study how students' anxiety and depression change before and after aerobics exercise.

The basic information and pretest comparisons of the two groups are shown in Table 1. Obviously, there is no statistical difference in age and physical condition between the two groups. ($P>0.05$)

Table 1. Basic information and pre-test comparison of two groups of subjects

Content	Category	Experience group	Control group	P
Age	20-22	48%	47%	0.213
	23-25	52%	53%	
Medical history	Yes	8%	10%	0.137
	No	92%	90%	

Influence of aerobics on depression

Before the aerobics exercise, T-test was conducted for the SDS scores of the two groups. The results showed that there was no statistical difference in the depression scores between the two groups ($P>0.05$). indicating the two groups are testable. The test results are shown in Table 2.

Table 2. Comparison of SDS scores between the two groups before the test

Grouping	$\bar{X} \pm S$	T	P
Test group	21.75±1.2	0.765	0.486
Control group	22.12±0.9		

After the test, the repeated measures analysis of variance was performed with the grouping as independent variable, the observation time as dependent variable, and the

SDS score as the variable. The test results in Figure 3 show clearly that the depression scores of the test group significantly decreased with time, but the control group had a subtle change. The SDS scores of male and female students were compared, as shown in Figure 4. It can be seen that the depression scores of the males both groups changed a little, but there was a big gap in the depression score among female students.

From Table 3, it can be concluded that the SDS scores of the test group changed significantly with time, indicating that there was a statistically significant difference between the two groups ($P < 0.05$); the SDS has an interaction action in terms of time and method, suggesting that aerobics can relieve the students' depression ($P < 0.05$).

The reasons why aerobics can relieve depression are that: 1) The exercises improve physical self-esteem, physical fitness and plasticity, internal confidence, and help establish a correct view of life and values; 2) Aerobics can improve interpersonal relationships, because it's mainly a teamwork sports inseparable from cooperation, and a harmonious interpersonal relationship needs to be established to improve their depression; 3) It's conducive to actively responding to setbacks, for aerobics have competition and cooperation like other sports, and not only does the body get exercised during exercise, but also one's will is tempered so that in the face of difficulties, one will rise to them and not be depressed; 4) Aerobics can help to generate a sense of accomplishment; the learning process of aerobics is also the process of self-satisfaction, in which the self-confidence can be improved, and the sustained sense of accomplishment can reduce the incidence of depression symptoms; 5) Sports distract ones from things, because they may usually focus on pondering problems, and the cerebral cortex is extra suppressed during exercises to put

unpleasant things behind.

Figure 3. SDS repeated measurements broken line diagram

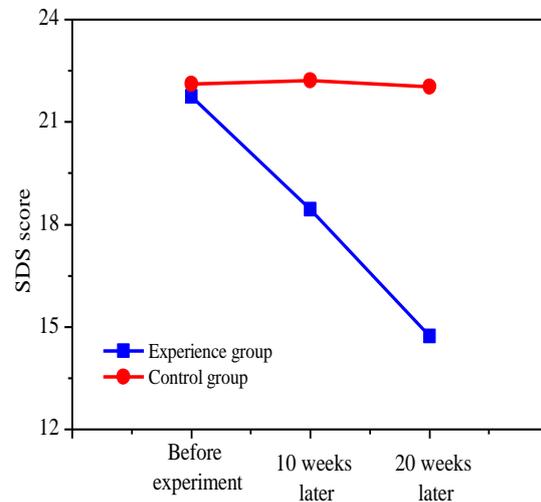


Figure 4. Breakdown chart of SDS repeated measurement for males and females in test group

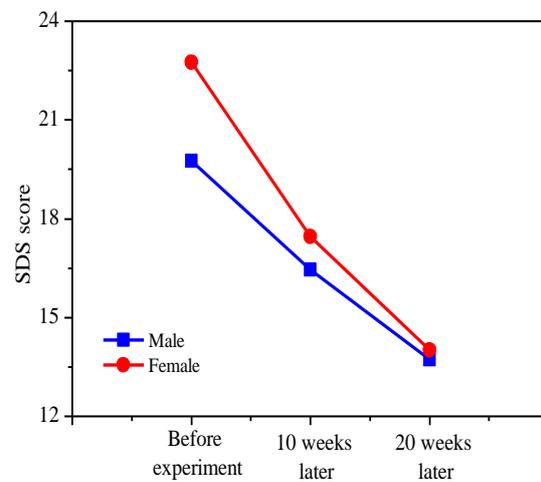


Table 3. Analysis of variance of SDS scores before and after the experiment

Group	Before experiment	10 weeks later	20 weeks later	Time effect		Interaction effect		Inter group effect	
				F	P	F	P	F	P
Experience group	21.75 ±1.2	18.45 ±2.1	14.73 ±1.7	119.21	0.000	103.64	0.001	12.031	0.000
Control group	22.12 ±0.9	22.21 ±0.9	22.03 ±0.8						

Influence of aerobics on anxiety

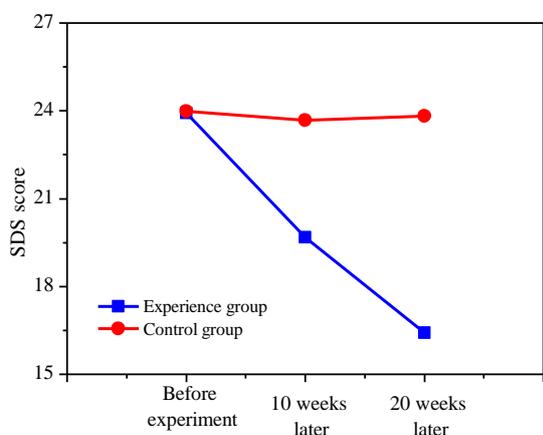
Before the test, the independent sample T-test was conducted on the SAS scores of the two groups. The results showed that there was no statistically significant difference in the SAS scores between the two groups ($P>0.05$), indicating that the two groups meet test conditions. The results are shown in Table 4.

Table 4. Comparison of SAS scores between the two groups before the test

Grouping	$\bar{X} \pm S$	T	P
Test group	24.42±0.7	0.312	0.283
Control group	23.98±1.1		

After the test, statistical repeated measures analysis of variance was performed to analyze the total scores of SAS students. With the time buckets as the abscissa and the SAS scores as vertical coordinate, the scores of two groups were compared, as shown in Figure 5.

Figure 5. Breakdown chart of SDS repeated measurement for males and females in test group

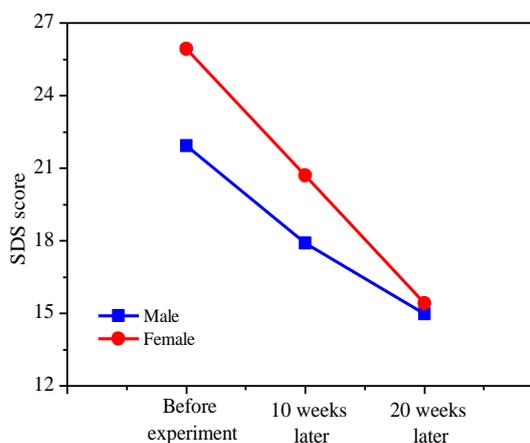


The SAS scores of the control group remained

unchanged with time, and had no statistical significance, while that of the test group significantly decreased before and after the test.

In Table 5, it can be seen that the SAS scores of the test group changed significantly with time, indicating that the difference in data was statistically significant ($P<0.05$), i.e., statistically, there was a significant difference between the two groups ($P<0.05$); SAS scores showed the interaction in terms of time bucket and method, indicating that aerobics can relieve the anxiety of students ($P<0.05$).

Figure 6. Breakdown of SAS repeated measurement for male and female students in the test group



The comparison of SAS scores between males and females is shown in Figure 6. It is obvious that the anxiety scores of males before the test were lower than those of females, which implies that females are more likely to be anxious in the face of setbacks. After the test, the anxiety scores of males and females were significantly reduced, and female's scores declined more, which means that aerobics is more effective in relieving anxiety among girls.

Table 5. Analysis of variance of SAS scores before and after the test

Group	Before experiment	10 weeks later	20 weeks later	Time effect		Interaction effect		Inter group effect	
				F	P	F	P	F	P
Test group	23.93 ±0.7	19.68 ±0.8	16.42 ±1.1	266.21	0.000	213.64	0.000	103.84	0.000
Control group	23.98 ±1.1	23.67 ±1.0	23.83 ±0.9						

CONCLUSION

This paper investigates the incidence of depression and anxiety symptom among students by means of questionnaire survey and mathematical statistics analysis, and explores the modulation effect of aerobics on the depression and anxiety. The conclusions are drawn as follows:

(1) Unlike male students of the same age group, female students, in the face of various pressures and setbacks, are more prone to depression and anxiety.

(2) Compared with students who have never participated in physical exercise, students with appropriate aerobics exercise could more effectively relieve their depression and anxiety, and more significantly improve their bad moods.

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