

Effectiveness of Aerobic Exercise in Reducing Stress and Anxiety among High School Level Boarding Students

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Abstract: *Students' mental stability can be restored by comfort from a familiar home environment and support from their parents. Secondary boarding school students are more prone to the symptoms of stress and anxiety because of academic pressure and lack of parental support. So helping the boarding school students to deal with the symptoms of stress and anxiety improves their self-confidence and academic performance, thus making a positive impact on their mental health. Objective: To evaluate the effect of aerobic exercise in reducing stress and anxiety among high school level boarding students. Methodology: 30 students from ST. Teresa's boarding school, Ernakulam were selected and divided into two groups: Experimental group and Control group after fulfilling the inclusion criteria. Each group consists of 15 students. Experimental group was given aerobic exercises that include walking, jogging and aerobic dance along with music therapy and control group was given only music therapy. Both groups received intervention for 3 days per week for 4 weeks. Pre- test and Post-test for both the groups were examined for stress using Perceived Stress Scale and anxiety by using Test Anxiety Questionnaire. Results: In this study, while within the group comparison, both group showed reduction in stress and anxiety. While comparing between the groups in case of stress and anxiety there is significant reduction in stress only. Conclusion: This study results shows both aerobic exercise and music therapy are effective in reducing stress and anxiety among high school level boarding students. But when compared between the groups, there is a significant reduction only in stress group, and not in anxiety group. Therefore from this study it is concluded that aerobic exercise along with music therapy are effective in reducing stress than music therapy alone.*

Keywords: Stress, anxiety, aerobic exercise, music therapy

1. Introduction

Secondary school can be regarded as a stressful environment to students, particularly boarding school. Multiple factors may lead to stress for students staying in boarding schools, including feeling of homesickness, academic pressure and lack of parent support. Most students regain their psychological stability while living at home with their parents. However, boarding school students have to adjust to living away from the security of their family and parental guidance. For many boarding school students, the separation from home for the first time may create feelings of doubt, confusion and anxiety. In the harassed mental symptom of boarding students, loneliness is the most terrible problem. Studies show that female students presented more symptoms of anxiety, stress and depression compared to the male counterparts. Several possible factors may explain this difference which includes hormonal, social pressure differences related to social competence and body image, and socio-cultural norms that encourage boys to minimize certain symptoms.[1]

Test anxiety is a combination of physiological over-arousal, tension and somatic symptoms, along with worry, dread, fear of failure, and catastrophizing, that occur before or during test situations. It is a physiological condition in which people experience extreme stress, anxiety, and discomfort during and/or before taking a test. This anxiety creates significant barriers to learning and performance. [2]

Physical activity in the form of aerobic exercise is a very fruitful means of coping with stress. The popular forms of aerobic activities that are most often pursued in order to help general cardiovascular condition may, in effect, improve the mental health of the individual. [3] There is growing research

evidence that regular aerobic exercise is associated with better psychological health. Both single sessions and long term programs of aerobic exercise have been shown to provide a positive benefit for psychological health. [4]

Scientists have found that regular participation in aerobic exercise has been shown to decrease overall levels of tension, elevate and stabilize mood, improve sleep and improve self-esteem. Even five minutes of aerobic exercise can stimulate anti-anxiety effects. [5]

Music has been shown to beneficially affect stress-related physiological, as well as cognitive and emotional processes. Thus, the use of listening to music as an economic, non-invasive and highly accepted intervention tool has received special interest in the management of stress and stress-related health issues. [6]

An academic examination is an extremely real-life stressful situation for secondary school students. The lack of parental support and feeling of homesickness during the preparation of exams disturbs the boarding students along with the burden of academic examination. Addressing the possible stressors and employing healthy coping may help in reducing negative emotional outcomes in these students. This points to the significance of physical activity among these students to help them cope with stress and improve their mental health. Regular aerobic exercise can increase self-confidence, and it can lower the symptoms associated with mild depression and anxiety. A number of studies have proved that aerobic exercise can reduce stress and anxiety but there is lack of literatures which proves the effect of aerobic exercise in reduction of stress and anxiety among boarding school students. So the current study focuses on evaluating the effect of aerobic exercise on reducing the

symptoms of stress and anxiety among boarding school students.

2. Methodology

Aims

To evaluate the effect of aerobic exercise and music therapy in reducing stress and anxiety among high school level girl students residing in boarding.

Objectives

- To find out the effectiveness of aerobic exercise in reducing stress in high school level boarding students.
- To find out the effectiveness of aerobic exercise in reducing anxiety in high school level boarding students.
- To find out the effectiveness of music therapy in reducing stress in high school level boarding students.
- To find out the effectiveness of music therapy in reducing anxiety in high school level boarding students.

Study Design

Pre-test- post-test experimental design

Study Settings

ST. Teresa's High School, Ernakulam, Kerala.

Study Duration

4 weeks

Sample Size

N = 30

15 in each group (Group A and Group B)

Sampling Method

Convenient sampling.

Outcome Measures

- Perceived Stress Scale
- PHCC Test Anxiety Questionnaire

Inclusion Criteria

Adolescent girls who:

- were in the age group of 14 to 19 years
- were residing in boarding schools for more than 1 year
- had moderate or severe stress as measured by Perceived Stress Scale
- had moderate or severe anxiety as measured by Test Anxiety Questionnaire

Exclusion Criteria

Adolescent girls who:

- Were already practicing another exercise
- Were unable to participate in the study due to health deviations
- Were physically challenged

Materials Used: Mat, music player.

Procedure

The study was conducted at St. Theresa's High School, Ernakulam. With the permission of the school authorities, we introduced ourselves and briefly explained the purpose of the study to the assembled high school level boarding

students. All the students were informed that the participation was voluntary. Students were asked to fill up the questionnaires, Perceived Stress Scale and PHCC Test Anxiety Questionnaire which would estimate the stress and test anxiety respectively. 30 students who had moderate to severe stress and anxiety were selected according to the inclusion criteria. The selected students were provided with consent forms. From that, randomly 15 students were selected as the experimental group and other 15 as the control group. The questionnaires were given before the sectional examinations and the scores obtained were noted as the pre-test values.

Group A – Experimental Group

This group received an exercise programme including 10 minutes of warm up and cool down exercise and 20 minutes of aerobic dance program. Music therapy was given for 15 minutes.

Group B – Control Group

This group received a Music therapy programme for 30 minutes.

Music Selection

In the present study, to nullify the possible response bias due to selection of music, relaxing music was selected. Instrumental Indian classical music (Natabhairavi Raag) was given in a relaxed seated position in a calm and distraction-free environment.

Post- Interventional Procedures

The interventions were given for 3 days/week for 4 weeks. After the provision of the interventions, the questionnaires were given again (post-test). The post test was done after the sectional exams in order to analyze the changes in stress and test anxiety. The scores obtained were noted as the post test scores.

3. Results

Students 't' test was used for the statistical analysis. Paired 't' test was used for the intra group comparison of pre and post test results. Independent 't' test was used for the inter group comparison. In this study, the mean value of stress was reduced from 19.667, SD 4.152 to 14.467, SD 2.825 in experimental group and in control group the mean value of stress reduced from 20.533, SD 3.357 to 18.267, SD 3.826 which shows significant difference within both experimental and control groups. Likewise, the mean value of anxiety was reduced from 37.533, SD 6.289 to 28.667, SD 4.082 in the experimental group and in the control group the mean value of anxiety reduced from 35.4, SD 5.755 to 31.733, SD 4.543 which shows significant difference within both experimental and control groups. While comparing between the groups in case of stress, there is a huge change in mean value and the p value is less than 0.001 and hence it is significant and it shows there are comparable changes between groups. And while comparing the two groups in case of anxiety p value is greater than 0.001 and hence not significant. So, there is significant reduction in stress and anxiety within both experimental and control groups. And a significant difference is seen only in stress when compared between the groups.

Table 1: Paired 'T' Test values
Paired 'T' Test (Comparison within Group)

Paired T Test		Experimental Group		Control Group	
Outcomes		Pre test stress	Post test stress	Pre test anxiety	Post test anxiety
Mean	Pre test	19.67	37.53	20.53	35.4
	Post test	14.47	28.67	18.27	31.73
S.D	Pre test	4.15	6.29	3.36	5.75
	Post test	2.83	4.08	3.83	4.54
Calculated t value		5.74	5.87	658	7.28
p Value		p<0.05	p<0.05	p<0.05	p<0.05

Table 2: Independent 'T' Test values
Independent 'T' Test (Between Groups)

Independent T Test		Pre test stress	Post test stress	Pre test anxiety	Post test anxiety
Mean	Experimental Group	19.67	14.47	37.53	28.67
	Control Group	20.53	18.27	35.4	31.73
S.D	Experimental Group	4.15	2.83	6.29	4.08
	Control Group	3.36	3.83	5.75	4.54
Calculated t value		0.63	3.095	0.97	1.95
p Value		p>0.05	P<0.05	p>0.05	p>0.05

4. Discussion

Aerobic exercise highly affects the mood status of an individual and ultimately reduces the stress and anxiety levels. The mental benefits of aerobic exercise have a neurochemical basis. Exercise reduces levels of the body's stress hormones, such as adrenaline and cortisol. It also stimulates the production of endorphins, chemicals in the brain that are the body's natural pain killers and mood elevators. The increased availability of important anti-anxiety neurochemicals, including serotonin, gamma aminobutyri acid (GABA), brain-derived neurotrophic factor (BDNF) and endocannabinoids is another benefit of aerobic exercise.

This study was to find out the effectiveness of aerobic exercise in reducing stress and anxiety among high school level boarding students. The experimental group was given aerobic exercise(dance) along with music therapy and the control group was given music therapy. The exercise session was conducted for 3 days/week for 4 weeks. The aerobic exercise included basic muscle stretching, walking, jogging and aerobic dance moves like hip roll, squatting, calf raises, side knee crunches, kickbacks, overhead reaches, body twists, bicycle crunches etc. Music therapy was based on the receptive relaxation method, which included group music listening sessions for 3 days/week for 4 weeks. After giving the exercise session for one month, the mean stress outcome changes from 19.667 to 14.467 in the experimental group and $P < 0.001$, hence there is significance. Thus it showed that aerobic exercise helps in reducing stress. And the mean of stress changes from 20.533 to 18.267 in the control group showing that there was a decrease in stress value among the control group as well.

After giving the exercise session of one month, the mean anxiety outcome changes from 37.533 to 28.667 in the experimental group and $P < 0.001$. Hence there is significance and that shows aerobic exercise helps in reducing anxiety and in the control group the mean anxiety

changes from 35.4 to 31.733 and the $P < 0.001$ and hence there is reduction in anxiety among the control group also. There is significant change in stress and anxiety in experimental and control group. And there is significant change in case of reduction of stress among both groups.

5. Conclusion

This study results show that both aerobic exercise and music therapy are effective in reducing stress and anxiety among high school level boarding students. But when compared between the groups, there is a significant reduction only in stress group, and not in anxiety group. Therefore from this study it is concluded that aerobic exercise along with music therapy are effective in reducing stress than music therapy alone among high school level boarding students.

6. Future Scope

- A follow-up could ensure the long term effect of the treatment program.
- Another outcome measures can be used.
- The duration of study should be increased.
- A large sample size should be taken to improve the consistency of the result.
- Further studies are required to find out the effectiveness of aerobic exercise in reducing anxiety.

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