

Effectiveness of Aerobics Exercises on Academic Stress and Physical Parameter among Higher Secondary Students

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Abstract: *Background:* Adolescence is a very important and productive period of life as well as a period of stress and crises. Higher secondary students are more prone to academic stress because of academic pressure and lack of parental support. Aerobic exercises are a fruitful means of coping with stress as well as maintaining physical parameters within normal range. It can help students to deal with stress symptoms and improve self-confidence and academic performance. *Objectives:* To evaluate the effectiveness of aerobic exercise on academic stress and physical parameter among higher secondary students. *Materials and Methods:* Quantitative approach with time series research design was used in the study. A purposive sampling technique was used to collect data from 50 higher secondary students of Sanatan Dharam Inter College, Racecourse. Four weeks of aerobic exercise were conducted for 45min for 5 days per week. Data were collected by using Standardized Academic Stress Scale and Physical Assessment Tool. *Results:* A significant reduction in academic stress and BMI with a mean difference (MD) of 27.08 and 0.08 was found significant ($p=0.001$). The calculated 'f' value is 61.70 and 4.261 which is greater than the tabulated value of 3.05 and 0.044 which was found significant ($p=0.001$). *Conclusion:* This study concluded that aerobic exercises are effective in reducing academic stress and maintaining physical parameters within normal range.

Keywords: Aerobic exercise, Academic stress, Physical parameters and Higher secondary students.

1. Introduction

School is an educational institute where children are prepared to become responsible citizens of tomorrow. The name of the school includes primary for young children and higher secondary to teenagers, who have completed primary education. Students studying in schools cover a large proportion of the global population.

The Unified District Information System reported that in India for 2021 - 22 the total students enrolled in schools from primary to higher secondary was 25.57 crore and the gross enrolment ratio in higher secondary has made a significant improvement from 53.8 % in 2020 - 21 to 57% in 2021 - 22. [1]

Higher secondary education refers to the education imparted in eleventh and twelfth standard in school. Higher secondary level education is important for further studies and getting admission to colleges. The pressure of studying and performing well is usually higher among higher secondary students which is leading to stress on them. [2] Stress is a negative emotion that occurs when a person tries to adjust or deal with stressors.

Academic stress is the pressure that students face due to the inability to fulfill academic demands. Teachers and parents have more expectations from the children but this expectation increases the pressure among students and students feel more stressed. These stresses decrease the daily activities of a student's life and increase the chance of anxiety, and depression - related disorders. [3] Academic stress not only affect mental health but physical health also. High levels of academic - related stress increase the risk of

young people developing preventable physical health problems later in life. A systematic review of prospective studies found that people who were stressed, such as during examination periods, were less likely to be physically active, the impact of which is associated with poor physical health outcomes [4]. Academic stress can be reduced by several non - pharmacological methods such as deep breathing exercises, relaxing muscles one at a time, regular aerobic exercises, guided imagery, and yoga. Aerobic exercises are physical exercises of low to high intensity that depend primarily on the aerobic energy - generating process.

2. Material and Methods

In this Quasi - experimental study, 50 higher secondary enrolled at Sanatan Dharam Inter College students were selected by applying Cochran's sample size formula and purposive sampling technique. The inclusion criteria for the study were subjects studying in 11th and 12th classes and available and willing to participate in this study. The subjects who have already undergone an aerobic exercises program, orthopedic - related problems, and any systemic illness were exclusion criteria. A standardized academic stress scale and self - structured physical assessment tool were used to assess academic stress levels and physical parameters. Then pre - test was taken and intervention for 2 weeks was given post - test 1st was conducted after that again 2 - week intervention was given and then a post - test 2nd conducted. Then the investigator gave aerobic exercises for approximately 45min, 5 days a week. The study was analyzed through ANOVA and Post hoc analysis.

3. Instrument/ Tool

The tool consists of Section A and section B and section C, Section A consist of socio – demographic data such as Age in years, gender, education status, occupation of parents, Monthly income of parents, Percentage obtained in the 10th exam, Type of family, Average self - study time per day, Leisure activities carried out in a day, Dietary pattern, and Mother education. Section B Section consists of Standardized Academic Stress Scale which was originally developed by Kim (1970) and adopted to Indian conditions by Rajendran and Kaliappan (1990) and Section C consists self - structured physical assessment tool.

4. Statistical Analysis

Frequency and percentage distribution were used to analyze the demographic variables and level of stress, and Mean and standard deviation were calculated. ANOVA analysis was performed to compare mean stress level and BMI between pre - test and post - test after intervention among higher secondary students post hoc analysis was performed to find MD in academic stress score and BMI between the three levels of assessment.

Table 1: Comparison of mean stress level between pre - test and post - test after intervention among higher secondary students, N=50

| Stress Level | Mean \pm SD | F - Value | DF | P - Value |
|--------------|--------------------|-----------|----|-----------|
| Pre - Test | 67.72 \pm 15.104 | 49.928 | 48 | 0.01 |
| Post Test 1 | 46.36 \pm 13.091 | | | |
| Post Test 2 | 40.64 \pm 9.785 | | | |

The hypothesis is tested at $p \leq 0.05$

Table 2: Post - hoc analysis (pair - wise multiple comparisons) of stress level between three levels of assessment, N=50

| Stress Level | Mean Difference | P - Value |
|-------------------------|-----------------|-----------|
| Pre - Test – Post Test1 | 21.36 | 0.001 |
| Posttest1 – Post Test2 | 5.72 | 0.002 |
| Pre - Test – Post Test2 | 27.08 | 0.001 |

The hypothesis is tested at $p \leq 0.05$

Table 4: Changes in selected physical parameter score of 50 higher secondary students in pre - test, post - test1, and post – test 2, N=50

| Variables | Mean \pm SD | | | F | P |
|-----------|--------------------|--------------------|--------------------|-------|-------|
| | Pre - Test | Post - Test1 | Post - Test2 | | |
| Weight | 49.28 \pm 12.248 | 49.28 \pm 12.248 | 49.16 \pm 12.180 | 6.682 | 0.013 |
| BMI | 21.78 \pm 3.190 | 21.78 \pm 3.190 | 21.70 \pm 3.144 | 4.261 | 0.044 |

Hypothesis is tested at the level of $p \leq 0.05$

Table 5: Post – hoc analysis of selected physical parameters scores of 50 students between three levels of assessment, N=50

| Variables | Pre - Test – Post - Test 1 | | Post - Test1 – Post - Test 2 | | Pre - Test – Post - Test 2 | |
|-----------|----------------------------|-------|------------------------------|-------|----------------------------|-------|
| | MD | P | MD | P | MD | P |
| Weight | 0 | >0.05 | 0.12 | 0.038 | 0.12 | 0.038 |
| BMI | 0 | >0.05 | 0.08 | 0.133 | 0.08 | 0.133 |

Hypothesis is tested at the level of $p \leq 0.05$

5. Discussion

In this study, fifty higher secondary students who were having mild to severe academic stress showed a significant reduction in academic stress and physical parameter with an MD of 27.08 and 0.08 following 4 weeks of aerobic exercise. The results of the present study were close to the study conducted by Valarmathi it revealed that the effectiveness of aerobic dance movement therapy on academic stress and the physical parameter was found to be statistically significant with $t = 6.14$ and 4.261 at $p < 0.0001$.

6. Ethical Consideration

The proposed study was conducted after the approval of the dissertation committee of the State College of Nursing. Formal approval was obtained from the Chief Education Officer and Principal of Sanatan Dharam Inter College. Informed written consent was obtained from each subject before starting the data collection. Assurance was given to the study subjects regarding the confidentiality of the data collected.

Conflict of Interest: None declared

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