

# Immediate Effect of Chair Aerobic Exercises for 'Test Anxiety' Among Students During Pre-Examination Period: An Experimental Study

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## ABSTRACT

**Background:** Immediate effect of chair aerobic exercises for 'test anxiety' among students during the Pre-examination period.

**Objective:** The objective of this study is to find out the immediate effect of chair aerobic exercise on "test anxiety" in the students during the pre-examination period using DASS 21 (Depression anxiety stress scale) by comparing pre and post-levels of DASS 21 in students.

**Methods:** The experimental study was carried out by selecting the students, those who were preparing for examinations, aged 18 to 25. Pre-DASS 21 score was taken and candidates were selected based on inclusion criteria. Written consent was taken. A session of aerobic exercises was taken and the post-DASS 21 score was compared during their pre-examination period. Analysis was done using Microsoft Excel and GraphPad.

**Results:** The total Pre-DASS 21 values and post-DASS 21 values were compared and analyzed by paired t-test, the p-value was  $< 0.0001$  which is considered extremely statistically significant.

**Conclusion:** The study concluded that chair aerobic exercises offered an effective and immediate means of reducing test anxiety among the students during their pre-examination period.

**Keywords:** Chair aerobics, test anxiety, students, examinations

## INTRODUCTION

Over the past decades, there has been an immense rise in mental health issues, among college-going and university students.<sup>[2]</sup>

During their college/university educational experience, some of the common problems faced by students are issues related to their families, economic hardships, problems associated with the college environment, addictions, assignments, presentations, and examinations<sup>[2]</sup>.

Almost everyone will feel nervous or experience some level of anxiety when faced

with an exam, assessment, or performance situation. This is a common and natural response for many students in the preparation before and during exams.<sup>[2]</sup>

To do well, we need to feel a little stressed or anxious; this makes us more mentally and physically aware during tests. The problem arises when our anxiety levels go above a certain point and start to affect our ability to study or perform.<sup>[2]</sup>

A moderate level of anxiety or stress is crucial to perform well – this helps us to be psychologically and physically alert in an

exam. [2] The challenge is when our level of anxiety increases past an optimal level such that it interferes with our studying or performance. [2]

Anxiety is an intense, excessive, persistent worry and fear about a situation.

Stress is any type of change that causes physical, emotional, or psychological strain.

Many people experience stress or anxiety before an exam. In fact, a little nervousness can help you perform your best. However, when this distress becomes so excessive that it interferes with performance on an exam, it is known as test anxiety [4]

Test anxiety is a type of performance anxiety. It can affect everyone from kindergarteners to PhD candidates. Anyone having test anxiety may have stress & anxiety even if they are prepared for their upcoming exams. [3]

Causes of test anxiety include fear of failure, parental pressure, procrastination, previous poor test performance, and unpreparedness. [4]

Biological cause: In stressful periods, such as before and during the test, the body releases a hormone called adrenaline, which helps the body deal with the "fight-or-flight" response.

In a lot of cases, the adrenaline rush helps to deal effectively with stressful situations, ensuring you are alert & ready. But for some, however, the symptoms of anxiety become so excessive that makes it difficult or even impossible to focus on the test. [4]

Symptoms of test anxiety consist of [4]:

- Physical symptoms: sweating, nausea, vomiting, diarrhea, stomach pain, rapid heartbeat, shortness of breath, headaches, or fainting.
- Emotional symptoms of test anxiety can include feelings of Self-doubt, Fear, stress, hopelessness, inadequacy, anger, and depression. [4]
- Cognitive/Behavioural: poor concentration, "going blank" or "freezing," confusion, and poor organization. Students often report "blanking out" even though they have studied sufficiently for the test.

Chair aerobics is a functional aerobic workout that is done using a chair. These exercises include warmups, the main component to improve cardiovascular fitness, and cooling down.

This study aims to find the immediate effect of chair aerobic exercises on 'Test anxiety' in the students during the pre-examination period using DASS 21 (Depression anxiety stress scale).

The objective is to compare pre and post-level DASS 21 in students.

## **MATERIALS & METHODS**

Study design -Experimental study

Sample size – 60

Sampling method - Convenient

Population- Students preparing for examinations.

Intervention duration- 20 -30 mins.

### **Selection criteria:**

#### **Inclusion criteria:**

1. Age group between 18 to 25
2. Both females & males.
3. Students preparing for professional courses.
4. Regularly attending the exams.
5. DASS pre-score – between mild to moderate levels of depression 10-20 anxiety 8-14, stress 15-25 (any one of the above criteria.)

#### **Exclusion criteria:**

1. Clinically diagnosed with any psychological disorder.
2. Students on antidepressant, antianxiety, antipsychotic medications.
3. Active psychological issues and currently on medications.
4. Clinical case of musculoskeletal, neurological, and cardio-vascular-related pathology.
5. Pregnant females.
6. Menstruating females.
7. Cognition, visual, auditory, and balance impairment.
8. Spinal deformities.
9. Specially abled students.

10. Students taking regular fitness training /gym.
11. Administration of any relaxation activities, addiction to music therapy, or consumption of caffeine on the day of evaluation.

### **PROCEDURE**

The participants were selected according to the selection criteria. The study and questionnaire were explained to the participants and written consent was taken. Pre-DASS-21 score data was collected before 48 hours of exam and post-DASS-21 score data was collected within 45 to 60 mins after chair aerobics exercises. Exercises were sequenced as, warmups (10 repetitions)-neck tilts, shoulder circles, arm reaches, chest stretches, core twists, seated side stretches, and leg stretches. Chair aerobics (7 repetitions) includes – side toe taps, leg marching, boxers, criss-cross, leg circles, clap hands with thigh taps, half jacks, kicks, sit stand, and clap. Cool down (10 repetitions) arm swings, arm reaches, chest stretches, body twists, seated side stretches, and leg stretches. Pre and post-scores of DASS21 were statistically analyzed and compared.

### **Outcome measure:**

Depression anxiety and stress scale (DASS-21). Reliability - 0.7- 8.81 and Validity - 0.65

It is a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. DASS-21 scores are split into the following categories:

Depression: Normal (0-9), Mild (10-13), Moderate (14-20), Severe (21-27), Extremely severe (28+).

Anxiety: Normal (0-7), Mild (8-9), Moderate (10-14), Severe (15-19), Extremely severe (20+).

Stress: Normal (0-14), Mild (15-18), Moderate (19-25), Severe (26-33), Extremely severe (34+).

### **RESULT**

This study evaluated 60 subjects. The pre-DASS-21 score was assessed. Chair aerobic exercises were carried out for 20- 30 minutes and then post-DASS-21 scores were collected.

Data was analyzed using Microsoft Excel and GraphPad for concluding the study. A paired t-test was used to assess the difference between pre and post-values. The various statistical measures such as mean, standard deviation, and test of significance were utilized to analyze the data.

The data is represented in tabular formats.

**TABLE 1: Immediate effect of chair aerobic exercises for test anxiety (depression). It shows the results:**

|              | <b>PRE-DEPRESSION</b> | <b>POST DEPRESSION</b> |
|--------------|-----------------------|------------------------|
| MEAN         | 6.95                  | 6.40                   |
| SD           | 2.52                  | 2.52                   |
| T VALUE      | 7.9717                |                        |
| P VALUE      | < 0.0001              |                        |
| SIGNIFICANCE | Extremely significant |                        |

**TABLE 2: The effectiveness of chair aerobic exercises for test anxiety (anxiety). It shows the following results:**

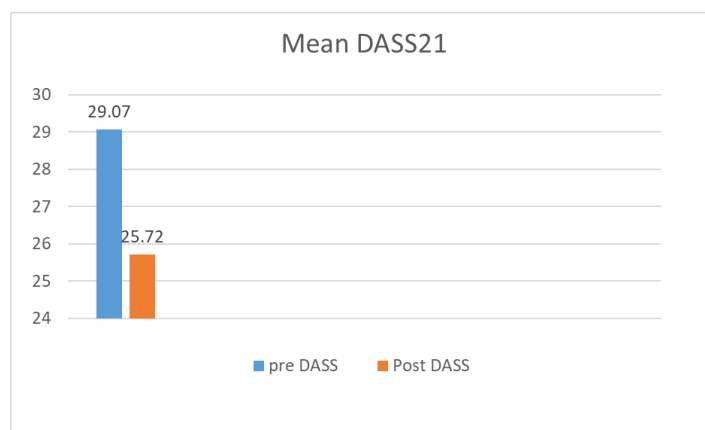
|              | <b>PRE</b>            | <b>POST</b> |
|--------------|-----------------------|-------------|
| MEAN         | 11.72                 | 9.93        |
| SD           | 1.72                  | 1.70        |
| T value      | 30.3984               |             |
| P value      | < 0.0001              |             |
| Significance | Extremely significant |             |

**TABLE 3: EFFECTIVENESS OF CHAIR AEROBIC EXERCISES FOR TEST ANXIETY (STRESS) It shows the following results:**

|              | PRE                    | POST |
|--------------|------------------------|------|
| MEAN         | 10.40                  | 9.38 |
| SD           | 2.46                   | 2.34 |
| T value      | 9.6881                 |      |
| P value      | < 0.0001               |      |
| Significance | Extremely significant. |      |

**TABLE 4: EFFECTIVENESS OF CHAIR AEROBIC EXERCISES FOR TEST ANXIETY TOTAL DASS21 SCORE It shows the following results:**

|              | PRE                    | POST  |
|--------------|------------------------|-------|
| MEAN         | 29.07                  | 25.72 |
| SD           | 4.70                   | 4.70  |
| T value      | 20.8200                |       |
| P value      | <0.0001                |       |
| Significance | Extremely significant. |       |



After analysis of the data, we can see that the pre-DASS21 score and post-DASS21 score have shown significant improvement in reducing symptoms of test anxiety in the student population during their pre-examination period.

## DISCUSSION

This experimental study aimed to investigate the immediate effect of chair aerobic exercises on test anxiety among students during the pre-examination period, utilizing the Depression Anxiety Stress Scale (DASS-21) to assess changes in anxiety levels. The study also sought to compare pre-and post-intervention levels of test anxiety to evaluate the effectiveness of the intervention. The findings of this study indicate a statistically significant immediate effect of chair aerobic exercises on reducing test anxiety among students preparing for examinations.

The obtained p-value of 0.005 suggests a highly significant difference in anxiety levels following the intervention. These results provide support for the alternative hypothesis, indicating that there is indeed a significant change in the state of test anxiety immediately after engaging in chair aerobic exercises.

The observed reduction in test anxiety post-intervention aligns with previous research suggesting the beneficial effects of physical activity on psychological well-being, including anxiety reduction. Chair aerobic exercises, despite their low-intensity nature and accessibility, appear to offer a viable intervention for mitigating test anxiety among students, particularly during high-stress periods such as the pre-examination period.

Exercise may also increase body temperature, and blood circulation in the brain and impact on hypothalamic-pituitary-

adrenal axis and physiological reactivity to stress. The possible psychological mechanisms include improvement of self-efficacy, distraction, and cognitive dissonance.<sup>[8]</sup>

These results confirm the acute effect of exercise i.e. the reductions in anxiety and depression after a single session of exercise. The changes in anxiety, depression, and mood states after exercise are explained most frequently by endorphin monoamine hypotheses.<sup>[8]</sup>

The utilization of the DASS-21 as a quantitative measure of anxiety levels adds credibility to the study's findings, providing a standardized assessment tool widely used in research settings. The comparison of pre- and post-intervention DASS-21 scores further strengthens the study's internal validity, allowing for a direct evaluation of the intervention's impact on test anxiety.

The intervention duration of 20-30 minutes is noteworthy, as it represents a feasible and time-efficient approach that could be easily integrated into students' daily routines without significantly disrupting their study schedules. This aspect of the intervention's design holds practical implications for potential implementation in educational settings, offering a simple yet effective strategy for managing test anxiety among students.

Exercise has therapeutic effects on depression in all age groups as a single therapy, an adjuvant therapy, or a combination therapy. Moderate-intensity exercise is enough to reduce depressive symptoms.<sup>[8]</sup>

The mechanisms of exercise therapy for depression are related to psychological mechanisms and physiological mechanisms. The former includes psychosocial and cognitive factors; the latter include anti-inflammatory effects, neuroplasticity mechanisms, etc.

The relationship between exercise and the hypothalamic pituitary adrenal (HPA) axis is complex and is influenced by the different natures of exercise and stress and the characteristics of the research population.

The antidepressant effects are related to hormonal responses. The mechanisms involved include increased testosterone levels and endorphins release.<sup>[13]</sup>

When stress affects the brain, with its many nerve connections, the rest of the body feels the impact of the same. Exercise and other physical activity produce endorphins i.e. chemicals in the brain that act as natural painkillers and also improve the ability to sleep, which reduces stress. About five minutes of aerobic exercises can begin to stimulate an anti-anxiety effect.<sup>[13]</sup>

However, several limitations warrant consideration. The study's reliance on convenient sampling and its narrow focus on students preparing for examinations in a specific geographical area may limit the generalizability of the findings to broader student populations. Additionally, the short-term nature of the intervention and assessment may not capture the long-term effects of chair aerobic exercises on test anxiety.

## CONCLUSION

In conclusion, this study demonstrates that chair aerobic exercises offer an effective and immediate means of reducing test anxiety among students during their pre-examination period.

### *Declaration by Authors*

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**Conflict of Interest:** The authors declare no conflict of interest.

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