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EFFECT OF STANDING YOGA POSTURES FOR EXAM INDUCED ANXIETY AMONG FIRST YEAR PHYSIOTHERAPY STUDENTS

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ABSTRACT

Background: Exam-induced anxiety is a prevalent issue among first-year physiotherapy students and can impair cognitive function, academic performance, and overall well-being. Standing yoga postures are known to promote relaxation, reduce anxiety and enhance mind–body awareness, making them a potential non-pharmacological strategy for managing academic stress. This study aimed to examine the effect of standing yoga postures on exam-related anxiety among first-year physiotherapy students. **Methods:** Forty physiotherapy students aged 18–21 years were selected through predefined inclusion and exclusion criteria. Ethical approval and informed consent were obtained before participation. Baseline anxiety levels were assessed using the Westside Test Anxiety Scale four weeks prior to the terminal examination. Participants then completed a structured four-week program of standing yoga postures. Post-intervention anxiety levels were reassessed after the examination using the same scale. Data were analysed using descriptive statistics, paired sample t-test, and Cohen's d to evaluate the magnitude of change. **Results:** The mean test anxiety score decreased from 2.88 at baseline to 2.66 after the intervention. Despite this numerical reduction, the paired t-test indicated that the change was not statistically significant ($p > 0.05$). The effect size was small (Cohen's $d = 0.19$), indicating minimal practical impact of the intervention. **Conclusion:** Standing yoga postures produced a mild reduction in exam-related anxiety but did not result in statistically significant improvements. While potentially beneficial as a

supportive strategy, future research with larger samples or longer intervention periods may be required to determine the true effectiveness of this approach.

KEYWORDS: Exam-induced anxiety; Standing yoga postures; Physiotherapy students; Stress reduction; Yoga intervention; Westside Test Anxiety Scale.

INTRODUCTION

Anxiety maybe defined as a subjective feeling of appreciation or dred about the present or future accompanied by number of autonomic signs and somatic symptoms such as ppalpitations, sweating, tremors. Encountering this situation during exam can lead to exam anxiety.[1]

Exam Anxiety are of two types

Disruptive anxiety: Affect individual behavior & individual performance during examination
Facilitative anxiety: Moderate or normal level of Anxiety which does not interfere in individual performance during examination.[2]

Factors causing exam anxiety

Lack of time management, Continuous exam with least gap, Anxiety of oral examination, studying all night before exam, do not recall & review[3] Negative & irrational thinking about exams.[4]

Some students have the skill & knowledge to do well in testing situation, but their excessive anxiety impairs the performance It hinders the student ability to remember think, judge & perform mentally which can lead to maximum failure rate[2] Their thoughts of the students are jumbled this they become more indecisive & may struggle to choose between two different answers.

Yoga: The Sanskrit word “yoga” comes from the root yug (to join), or yoke (to bind together or to concentrate). Essentially, however, the word “yoga” has come to describe a means of uniting or a method of discipline: to join the body to the mind and together join to the self (soul), or the union between the individual self and the transcendental self. Yoga comes from an oral tradition in which teaching was transmitted from teacher to student.[5]

The Indian sage Patanjali, called “The Father of Yoga,” collated this oral tradition in his classic work The Yoga Sutras, a 2000-year-old treatise on yogic philosophy. He defines yoga

as "that which restrains the thought process and makes the mind serene." Patanjali suggests that ethics (yama and niyama) is the way to cleanse the mind, body, and spirit. He emphasizes a more psychological approach to healing and self-realization. The body's organs and systems are to be cleansed first through asanas (postures) and pranayama (controlling the breath).[5]

Benefits of yoga: Yoga has been the subject of research in the past few decades for therapeutic purposes for modern epidemic diseases like mental stress, obesity, diabetes, hypertension, coronary heart disease, and chronic obstructive pulmonary disease. Individual studies report beneficial effect of yoga in these conditions, indicating that it can be used as non-pharmaceutical measure or complement to drug therapy for treatment of these conditions.[6]

Standing Yoga Posture: Standing yoga postures, also known as "standing asanas," can help reduce stress and anxiety by promoting relaxation, improving mood, and enhancing overall well-being.

Benefits ofstanding yoga postures – Reduces cortisol levels: Standing yoga postures, such as Mountain Pose (Tadasana) and Tree Pose (Vrksasana), have been shown to decrease cortisol levels, which can help reduce stress and anxiety.

Activates relaxation response: Standing yoga postures, such as Downward-Facing Dog (Adho Mukha Svanasana) and Warrior Pose (Virabhadrasana), can activate the relaxation response, which helps to calm the mind and body.

Improves mood: Standing yoga postures, such as Triangle Pose (Trikonasana) and Side Angle Pose (Utthita Parshvakonasana), can improve mood by increasing the production of neurotransmitters such as serotonin and dopamine.

Enhances self-awareness: Standing yoga postures, such as Eagle Pose (Garudasana) and Crow Pose (Bakasana), can enhance selfawareness, which can help individuals better manage stress and anxiety.

Reduces symptoms of anxiety and depression: Standing yoga postures, such as Standing Forward Fold (Uttanasana) and Plank Pose (Phalak asana), ha ve been shown to reduce symptoms of anxiety and depression in individuals with chronic stress.

MATERIAL AND METHODS

This was an interventional study set in thane Mumbai Maharashtra India with a duration of 18 months. A total of 40 individuals who were first year physiotherapy students between the ages 18 to 21 years participated in this study. A written form of consent was taken from all the participants and the purpose of study along the instructions were explained prior to participation in the study.

Inclusion criteria

Physiotherapy students willing to participate, Students Appearing for terminal examination. Age group- 18-21 years, Gender- male & female.

Exclusion criteria

Subjects declining to participate, Subjects diagnosed with anxiety depression or any mental illness, Subjects undergoing treatment for any mental illness, Subjects undergoing any medical treatment.

Ethical approval for the study was obtained from the Institutional Ethical Committee prior to the commencement of data collection. Following approval, the recruitment process began with the screening of students based on predetermined inclusion and exclusion criteria to ensure the selection of appropriate participants for the study.

Eligible students were approached individually, and the objectives, importance, and overall procedure of the research were clearly explained to them. Participants were informed about the voluntary nature of their involvement and their right to withdraw at any stage without any academic or personal consequences. After this explanation, written informed consent was obtained from all participants prior to their enrolment in the study.

To establish baseline anxiety levels, the Westside Test Anxiety Scale was administered four weeks before the scheduled Terminal examination. This initial assessment served as the pre-test measurement for evaluating test-related anxiety.

Following the baseline assessment, the intervention phase commenced. For a period of four weeks prior to the terminal examination, participants underwent a structured program of standing yoga postures. These sessions were conducted according to a standardized protocol designed to promote relaxation and reduce anxiety among the students.

Upon completion of the terminal examination, the Westside Test Anxiety Scale was again administered to all participants. This post-test assessment allowed for the comparison of anxiety levels before and after the intervention, enabling evaluation of the effectiveness of the standing yoga program.

RESULTS

Descriptive Statistics

Descriptive statistics are methods used to summarize and organize data so that it can be easily understood. They describe the main features of a dataset through measures such as mean, median, mode, standard deviation, range, and percentage. In research, descriptive statistics provide a clear overview of participants' scores (e.g., before and after an intervention) and help in understanding patterns, trends, and variability before conducting further inferential analysis.

Test Anxiety score Before		**Test Anxiety score After**	
Mean	2.8825	Mean	2.6575
Standard Error	0.137369402	Standard Error	0.126130147
Median	2.85	Median	2.6
Mode	2.5	Mode	2.5
Standard Deviation	0.868800381	Standard Deviation	0.797717095
Sample Variance	0.754814103	Sample Variance	0.636352564
Kurtosis	-0.663393762	Kurtosis	0.474960876
Skewness	0.291260999	Skewness	0.531822163
Range	3.4	Range	3.6
Minimum	1.4	Minimum	1.4
Maximum	4.8	Maximum	5
Sum	115.3	Sum	106.3
Count	40	Count	40

CONCLUSION

The mean Westside Test Anxiety score decreased from 2.88 before the intervention to 2.66 after the standing yoga posture. This indicates a slight reduction in exam-related anxiety among the first-year physiotherapy students.

Standard deviation decreased slightly (0.87 → 0.80), meaning the scores became a bit more consistent after the intervention.

Skewness and kurtosis values show that the data distribution remained approximately normal before and after the intervention Overall, the yoga intervention produced a minor decrease in

anxiety, reflecting a small practical effect. Further research with larger samples or additional interventions may be needed to achieve more substantial anxiety reduction.

Normality

In statistics, normality tests are used to determine if a data set is well-modeled by a normal distribution.

Problem: To investigate whether data of Test Anxiety Score Before & Test Anxiety Score After for First Year Physiotherapy Students is normally distributed or not.

Hypothesis

We have to test the hypothesis as,

Null Hypothesis: H_0 = Set of data comes from a normal distribution.

v/s

Alternative (Research) Hypothesis: H_1 = Set of data do not come from a normal distribution.

SPSS Output

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Difference	40	100.0%	0	0.0%	40	100.0%

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Differene	.079	40	.200*	.968	40	.306

This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The above table shows the results of Kolmogorov-Smirnov and Shapiro-Wilk tests of normality (tests statistic, degrees of freedom, p-value). Since we have less than 50 observations (N = 40 < 50), we will interpret the Shapiro-Wilk test results.

Here we can see that p-value provided by SPSS is **.306** which is greater than 0.05 (i.e. p > 0.05) therefore we have significant evidence to reject the alternative hypothesis. This indicates that "**Set of data comes from a normal distribution.**"

CONCLUSION

Since our set of data comes from a normal distribution, we can go for parametric test such as **paired sample t-test.**

Paired sample t-test

The paired sample t-test is used when we are comparing two related samples — in this case, measurements from the same individuals using their Test Anxiety Score Before & Test Anxiety Score After, we are checking whether the average test anxiety score changed significantly after the intervention of standing yoga posture.

Hypothesis

We have to test the hypothesis as,

Null Hypothesis: H_0 = There will be no statistically significant difference seen in reduction in anxiety after intervention of standing yoga posture for exam induced anxiety among first year physiotherapy students**.**

v/s

Alternative (Research) Hypothesis: H_1 = There will be statistically significant difference seen in reduction in anxiety after intervention of standing yoga posture for exam induced anxiety among first year physiotherapy students**.**

SPSS Output

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Test Anxiety score Before	2.883	40	.8688	.1374
Pair 1				
Test Anxiety score After	2.657	40	.7977	.1261

		t	df	Sig. (2-tailed)
Pair 1	Test Anxiety score Before - Test Anxiety score After	1.175	39	.247

Here we can see that p-value provided by SPSS is **.**247 which is greater than 0.05 (i.e. p > 0.05) therefore we have significant evidence to reject the alternative hypothesis. This

indicates that "There will be no statistically significant difference seen in reduction in anxiety after intervention of standing yoga posture for exam induced anxiety among first year physiotherapy students**.**"

In other words, we can say that, on average anxiety decreased slightly after the yoga session **(**from 2.883 to 2.657**)**. However, this change is not statistically significant since (p value > 0.05)

Cohen's d for paired samples (Effect Size Measure*)*

Cohen's d is a measure of effect size that quantifies the difference between two means in terms of standard deviations. A larger Cohen's d value indicates a greater effect size, and it allows for the comparison of results across different studies and variables.

Formula for Cohen's d

$$d = \frac{M(diff)}{SD(diff)}$$

Where,

- M(diff) = Mean (Before - After)
- SD(diff) = SD of the (Before - After) differences

CALCULATION

(We have considered 40 paired data of first year physiotherapy students to calculate Cohen's d using their Test Anxiety Score Before & Test Anxiety Score After)

$$\mathbf{d} = \frac{M(diff)}{SD(diff)}$$

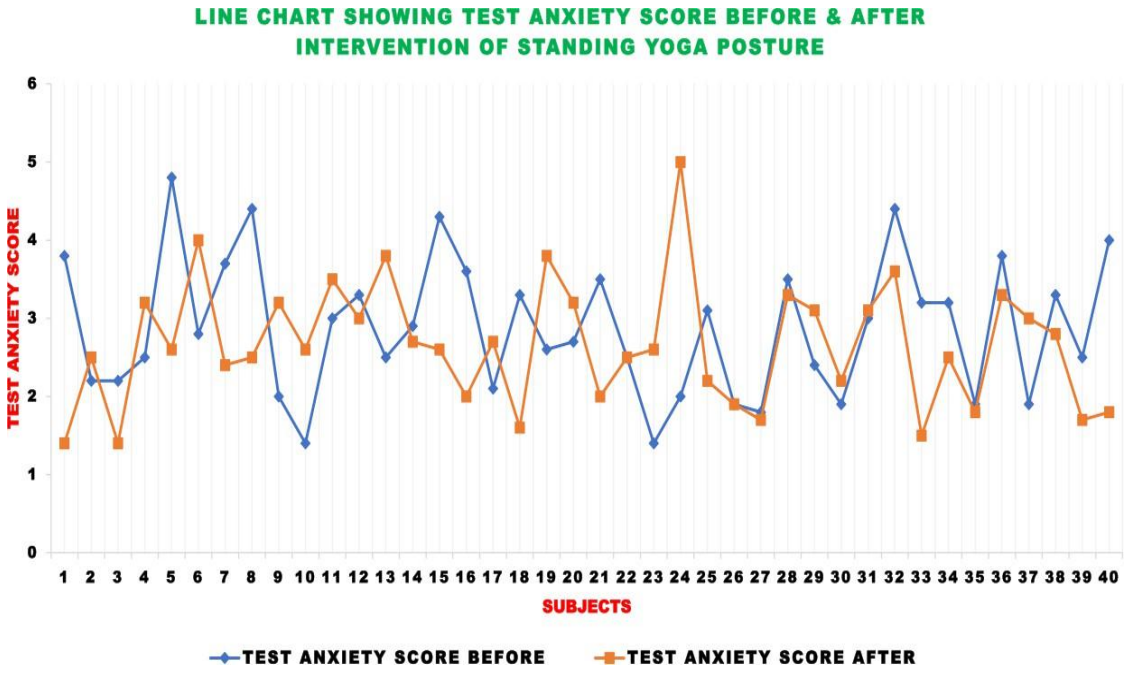
$$\mathbf{d} = \frac{\mathbf{0.225}}{\mathbf{1.211}}$$

d = 0.19

CONCLUSION

A Cohen's d value of 0.19 indicates a small effect size, meaning the reduction in test anxiety after the yoga intervention was minimal. While there may be a statistically detectable change, the practical impact of the intervention on students' anxiety levels appears to be limited.

Line Chart



SUBJECTS

Line chart showing test anxiety score before & after intervention of standing yoga posture Test anxiety score before test anxiety score after test anxiety score.

CONCLUSION

This line chart clearly shows the Test Anxiety Scores Before and After the intervention of the standing yoga posture for each of the 40 subjects.

Overall trend: For most subjects, the test anxiety scores decreased after the yoga intervention (orange line generally lower than blue line), indicating a reduction in exam-related anxiety.

Individual variability: The lines fluctuate for each subject, showing that the amount of change varies individually—some students had a larger decrease, while a few showed little or no change or even a slight increase.

Peaks and dips: Several subjects with higher anxiety scores before the intervention (blue peaks) generally, show noticeable drops afterward (orange dips).

Consistency: The post-intervention scores are relatively less scattered compared to before, suggesting some stabilization or reduction in variability of anxiety levels.

Effectiveness: These visual supports that the standing yoga posture intervention was generally effective in reducing test anxiety for the majority of students, although the extent of reduction varies.

DISCUSSION

The research presented is a focused intervention study designed to evaluate the impact of standing yoga postures on exam-induced anxiety in a cohort of first-year physiotherapy students. This study provides an in-depth exploration using descriptive statistics, formal hypothesis testing, and effect size measurement to determine the efficacy of the intervention

Methodology and Study Design: The study utilized a sample of 40 first-year physiotherapy students, all of whom were appearing for their terminal examination for the first time. The study employed convenient sampling and implemented a 4-week intervention of standing yoga postures prior to the university examination.

The anxiety level was measured using the Westside Test Anxiety Scale both before the intervention and after the terminal examination. The core of the investigation rested on the paired sample t-test, a parametric test chosen after confirming the normality of the data distribution.

The central hypotheses were

Null Hypothesis (H_ {0}): There is no statistically significant difference in the reduction in anxiety after the yoga intervention. Alternative Hypothesis (H_ {1}): There is a statistically significant difference in the reduction in anxiety.

Descriptive and Normality Analysi**s:** Descriptive Summary The preliminary descriptive statistics indicated a favorable shift in the test anxiety scores:

Mean Anxiety Score decreased from 2.88 (Before) to 2.66 (After) the intervention. This indicated a slight reduction in exam-related anxiety among the students.

Normality Testing: Normality tests are crucial for justifying the use of parametric tests like the t-test. Since the sample size was less than 50 (N=40), the Shapiro-Wilk test results were interpreted.

The p-value for the Shapiro-Wilk test was 0.306. 43
Since p > 0.05 (0.306 > 0.05), the null hypothesis of normality was retained, concluding that the data comes from a normal distribution. This confirmed the validity of using the paired sample t-test for inferential analysis.

Analysis and Effect Inferential Size**:** Paired Sample T-Test Results, the t-test was performed to determine if the mean difference in anxiety scores was statistically significant. The test yielded a t-statistic of 1.175 with 39 degrees of freedom (df). The resulting two-tailed p-value (Sig. 2-tailed) was 0.247.

Conclusion on Significance: The crucial finding is that the p-value of 0.247 is greater than the \alpha level of 0.05 (p > 0.05). Therefore, the study failed to reject the Null Hypothesis (H_ {0}). This means that while the anxiety decreased slightly on average (from 2.883 to 2.657), this change was not statistically significant. In practical terms, the study found no statistically compelling evidence that the standing yoga posture intervention caused a significant reduction in exam anxiety in this group of students. Effect Size (Cohen's d) Beyond statistical significance, the study calculated Cohen's d to quantify the practical magnitude of the effect.

The calculated Cohen's d value was 0.19. This value indicates a small effect size. This strengthens the overall conclusion: even though a numerical reduction was observed, the practical impact of the intervention on the students' anxiety levels was minimal and limited.

CONCLUSION

The study aimed to determine the effect of standing yoga postures on exam-induced anxiety among first-year physiotherapy students. Based on the Westside Test Anxiety Scale scores, students showed a slight reduction in anxiety levels after the four-week standing yoga intervention. Although the mean anxiety score decreased from 2.88 to 2.66, the paired t-test results revealed that this change was not statistically significant (p > 0.05).

The effect size (Cohen’s d = 0.19) further indicates that the magnitude of improvement was small, suggesting only a minimal practical impact. Overall, while standing yoga postures

produced a mild reduction in anxiety for many students, the improvement was not strong enough to be considered statistically significant in this sample. The findings highlight that yoga may offer some benefit but may need to be combined with other strategies, delivered for a longer duration, or tested on a larger sample to observe more meaningful reductions in exam-related anxiety.

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