

A Pre-Experimental Study to Assess the Impact of Deep Breathing Exercises on Reducing Stress Levels Among Nursing Students at Shambhunath Research Institute of Medical Sciences & Hospital, Jhalwa, Prayagraj.

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Introduction

Stress is a significant concern among students, particularly nursing students, as they face multiple academic and clinical demands. Academic stress can arise from excessive assignments, shift duties, faculty relations, and time pressure, which may adversely impact their performance and well-being if not managed effectively. Deep breathing exercise is a simple, cost-effective, and evidence-based relaxation technique known to reduce physiological arousal and promote calmness.

Objectives:

1. To measure the pre-test and post-test stress levels among nursing students at Shambhunath using a validated stress inventory.
2. To evaluate the effectiveness of deep breathing exercise intervention in reducing stress levels among nursing students.
3. To compare the pre-test & post test level of stress to determine the impact of deep breathing exercise.
4. To investigate the association between pre-test stress levels and selected socio demographic variables, including age, gender, family type, religion, family income, and type of residence.

Methods: A pre-experimental one-group pre-test–post-test design was adopted. Using non-probability simple random sampling, 60 nursing students from selected institutes in Shambhunath were recruited.

Academic stress levels were measured using a modified Academic Stress Scale with established validity and reliability. Deep breathing exercises were taught and practiced daily for 21 consecutive days under supervision. Post-test stress scores were collected after the intervention. Data were analysed using descriptive and inferential statistics to evaluate the effectiveness of the intervention and the association with socio demographic variables.

Results: The findings revealed a significant reduction in post-test stress scores compared to pre-test scores, indicating the effectiveness of deep breathing exercises in lowering stress levels among nursing students. Statistical analysis confirmed that the difference was significant, supporting the research hypothesis (H1).

Conclusion: Deep breathing exercises are an effective, simple, and non-pharmacological intervention to reduce academic stress among nursing students. Incorporating such relaxation techniques into nursing education can enhance students' coping ability and improve their overall well-being and academic performance.

Keywords: Deep breathing exercises, Academic stress, Nursing students, Stress management, Relaxation technique.

BACKGROUND OF THE STUDY:

Nursing students experience significant stress during their journey to becoming professional nurses. Major sources of stress include excessive homework, unclear assignments, shift duties, academic requirements, and relations with faculty members, clinical experiences, and time constraints. This demanding academic and clinical environment, if not managed properly, can negatively affect students' performance and overall well-being. Therefore, the use of effective stress management strategies becomes crucial. Among various relaxation techniques, progressive muscle relaxation is considered one of the most effective methods for reducing stress, as it decreases arousal levels and promotes a calmer physiological and psychological state.

Stress is a mental or physical response generated through an individual's cognitive appraisal of a situation and is shaped by interactions with the environment. Stress among nursing students is a global concern and stems from multiple sources. Although stress cannot be entirely avoided, students' ability to cope with these stressors is critical for their academic success and personal growth.

In educational settings, academic stress has emerged as a major concern. The demanding curriculum, competitive atmosphere, and societal expectations place a considerable burden on nursing students. Recognizing the need for effective interventions, the present study investigates the impact of deep breathing exercises as a potential strategy to reduce stress. Academic stress has been linked with impaired cognitive functioning, poor mental health, and decreased academic performance. According to the World Health Organization (WHO), stress is considered the "Health Epidemic of the 21st Century." Globally, UNESCO reports that 9 out of 10 B.Sc. Nursing students (87%) across 165 countries are affected by stress. In India, studies reveal that 93%–100% of B.Sc. Nursing students experience medium to moderate stress, while 1.9% exhibit severe stress. In Kerala, 22.5% experience high stress levels and 77.5% moderate stress.ⁱ

Over the past few years, academic pressures have intensified due to examinations, assignments, and multiple co-curricular requirements. These expectations often force students to work relentlessly, leading to heightened stress. Additionally, the pressure to participate in extracurricular activities and be “all rounder’s” further contributes to the stress burden. Lack of appropriate counselling channels results in confusion and difficulty in carrier decision making. Constant deadlines and workload can feel overwhelming, and adolescents are especially vulnerable due to the transitional nature of their developmental stage. Hence, understanding the sources and impact of academic stress is essential to design efficient and practical intervention strategies.ⁱⁱ

Stress is a natural response that can result in physical, emotional, or psychological strain. It activates the body’s fight-or-flight mechanism, causing the release of stress hormones that prepare the body to confront or escape perceived danger. Anger and stress can be triggered by external factors such as family problems, financial strain, and social pressures, or internal factors such as hopelessness and hormonal imbalances. The inability to manage these effectively may lead to behavioural disturbances and emotional exhaustion. The present study primarily aims to assess the effectiveness of deep breathing exercises and meditation on stress and anger management among nursing students.ⁱⁱⁱ

Nursing students are further exposed to hospital-related stressors, in addition to those arising from theoretical training. Hospitals are considered highly stressful work environments due to their association with life-and-death situations. Such exposure can impact personality development and may lead to maladaptive behaviours.³

Deep Breathing Exercise

Deep breathing exercise is a simple, cost-effective, and powerful method for reducing stress, anxiety, and other health-related issues. It is considered one of the easiest and cheapest relaxation techniques to practice. Also referred to as diaphragmatic breathing, this technique is based on the principle that mind–body integration promotes relaxation. Participants are encouraged to contact the diaphragm and inhale and exhale slowly. Deep breathing increases blood oxygen levels, massages the abdominal organs, and may stimulate the vagus nerve, thus enhancing parasympathetic activity.⁴

Evidence from multiple studies has shown that deep breathing positively impacts stress, anxiety, and negative emotional states. For example, an experimental study conducted in China recruited 40 healthy participants and demonstrated that deep breathing significantly improved attention, reduced negative effect, and lowered stress levels. Relaxation techniques, including deep breathing, reduce physiological symptoms such as tachycardia, dyspnoea, and muscle tension, while improving emotional regulation and calmness.^{iv}

NEED FOR THE STUDY

According to a survey conducted by the American Psychological Association (2011), nearly one-third of individuals report being extremely stressed, which negatively affects their work performance, productivity, and even eating habits. Major stressors include work demands, financial issues, housing problems, relationship challenges, and parenting responsibilities. Breathing exercises have been proven effective for quickly reducing stress, releasing bodily tension, and calming the mind. They require minimal practice, can be performed anywhere, and are among the most widely recommended stress-relief techniques. They not only reverse stress responses but also help prevent the long-term harmful effects of chronic stress. (Andrea Watkins).^v

In today's competitive environment, students face multiple academic problems such as exam anxiety, lack of interest in classes, and difficulty understanding subjects. Academic stress is defined as the feeling of anxiety or apprehension regarding academic performance, which may hinder students from performing to the best of their ability. As future healthcare professionals and “pillars” of society, nursing students must be supported with effective interventions to manage stress and perform optimally.^{vi}

Given the high prevalence of stress among nursing students and the lack of adequate counselling services, there is a strong need for accessible, self-administered interventions. Deep breathing exercises provide a simple, evidence-based, and cost-effective strategy to enhance psychological well-being and academic performance. By practicing diaphragmatic breathing, students can reduce sympathetic nervous system activity, enhance parasympathetic function, and improve resilience to academic stress. Hence, this study aims to assess the impact of deep breathing exercises on stress reduction among nursing students at Shambhunath, offering a practical and scalable solution for stress management in nursing education.

AIM OF STUDY:

This study aims to evaluate the effectiveness of deep breathing exercises in reducing stress levels among nursing students at Shambhunath Research Institute of Medical Sciences & Hospital, Jhalwa, Prayagraj. By implementing a structured 21-day intervention, the study seeks to empower students with a practical, evidence-based tool to manage academic stress and improve their mental and emotional health.

STATEMENT OF PROBLEM:

A pre-experimental study to assess the impact of deep breathing exercises on reducing stress levels among nursing students at Shambhunath Research Institute of Medical Sciences & Hospital, Jhalwa, Prayagraj.

OBJECTIVES:

1. To measure the pre-test and post-test stress levels among nursing students at Shambhunath using a validated stress inventory.
2. To evaluate the effectiveness of a 21-day deep breathing exercise intervention in reducing stress levels among nursing students.
3. To compare the pre-test & post test level of stress to determine the impact of deep breathing exercise.
4. To investigate the association between pre-test stress levels and selected socio demographic variables, including age, gender, family type, religion, family income, and type of residence.

HYPOTHESES

1. **H0:** There will be no significant difference between pre-test and post-test stress scores among nursing students following the deep breathing exercise intervention.
2. **H1:** There will be a significant reduction in post-test stress scores compared to pre-test scores among nursing students following the deep breathing exercise intervention.
3. **H2:** There will be a significant association between pre-test stress levels and selected socio demographic variables among nursing students.

OPERATIONAL DEFINITIONS:

- ✓ **Deep Breathing:** A relaxation technique involving slow, deep inhalation through the nose and exhalation through the mouth, engaging the diaphragm to promote physiological and psychological relaxation.
- ✓ **Stress:** A state of mental, emotional, or physical strain resulting from academic, clinical, or personal demands, measured using the Modified Student Stress Inventory.
- ✓ **Assessment:** The process of evaluating the impact of deep breathing exercises on stress levels through pre- and post-intervention measurements using a standardized tool.
- ✓ **Pre- experimental:** The structured administration of deep breathing exercises as an intervention to measure its effect on stress levels in a controlled study setting.

DELIMITATION:

1. **Sample Size:** The study is limited to 60 nursing students, which may restrict generalize ability to a broader population.
2. **Population:** Restricted to nursing students enrolled at Shambhunath Research Institute, excluding other student groups.
3. **Study Design:** The pre-experimental design lacks a control group, potentially introducing threats to internal validity, such as maturation or testing effects.
4. **Sampling:** The use of simple random sampling limits representation of diverse student populations beyond nursing

DATA ANALYSIS AND INTERPRETATION HAVE BEEN DONE UNDER THE FOLLOWING HEADINGS

Section A-Criteria-wise analysis of impact of deep breathing exercise and level of stress

Section B-Chi-square analysis showing association between pre-test and post test level of stress with their selected demographic variables

SECTION A**CRITERIA-WISE ANALYSIS OF IMPACT OF DEEP BREATHING EXERCISE AND LEVEL OF STRESS**

Table 1.1: Distribution of subject according to level of stress nursing students based on Pre-Test and Post-Test

Criteria	Pre-Test Frequency (N=60)	Pre-Test (%)	Post-Test Frequency (N=60)	Post-Test (%)
No Stress (30–39)	0	0	35	58
Mild (40–59)	11	18	21	35
Moderate (60–79)	22	37	4	7
Severe (80–90)	27	45	0	0
Total	60	100.0%	60	100.0%

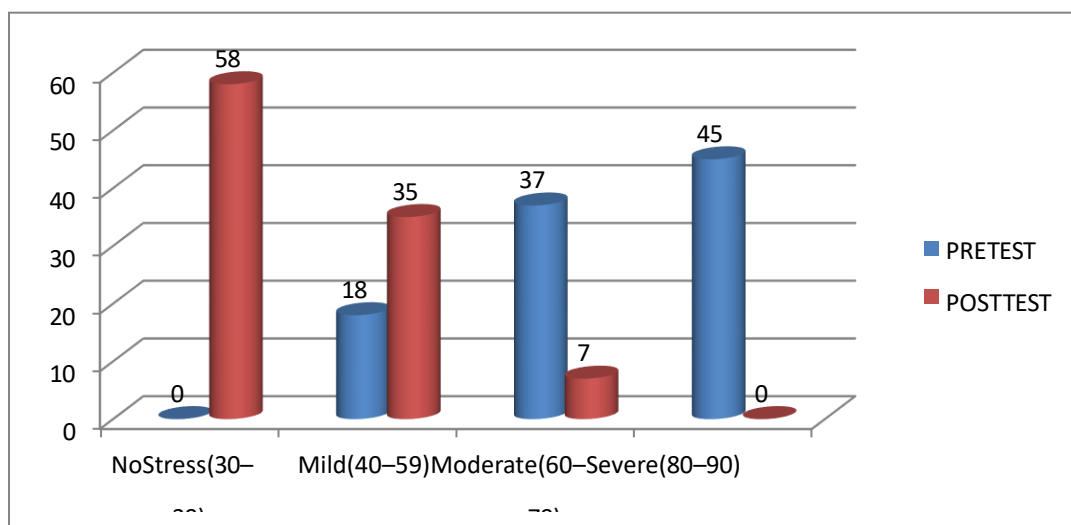


Figure 5.1: cylindrical graph depicts that during pre-test, 45% (n = 27) of nursing students had severe stress, followed by 37% (n = 22) with moderate stress and 18% (n = 11) with mild stress, while none had any stress. Whereas in post-test, 58% (n = 35) of nursing students had no stress, 35% (n = 21) had mild stress, 7% (n = 4) had moderate stress, and none had severe stress.

Table 1.2: Comparison of Pre-Test and Post-Test Stress Scores

(N=60)

Test Phase	MeanScore	Mean difference	Standard Deviation (SD)	SD difference	P Value
Pre-Test	94.48	16.56	16.84	11.19	<0.001
Post- Test	77.92		5.65		

Shows a comparison of pre-test and post-test stress scores among nursing students (N = 60). The mean pre-test stress score was **94.48 ± 16.84**, which decreased to **77.92 ± 5.65** in the post-test after deep breathing exercises. The mean difference was **16.56** with an SD difference of **11.19**. The obtained **p value (< 0.001)** indicates a statistically highly significant reduction in stress levels, demonstrating the effectiveness of deep breathing exercises.

Table10: Association between Pre-Test Stress Levels and Sociodemographic Variables (Chi-Square Test)

Chi-Square analysis of post-test

S.No	Socio demographic Variables	Percentage	Mild	Mode rate	Severe	Chisquare	DF	Critical analysis	Inference
1	Age In Year					3.21	4	9.49	NS
	17–20years		50	48	0				
	21–23years		58	42	0				
	24–26years		50	50	0				
	Above26years		0	0	0				
2	Gender					1.84	2	5.99	NS
	Male		55	45	0				
	Female		58	42	0				
	Others		0	0	0				
3	Family type					2.67	4	9.49	NS
	Nuclear		56	44	0				
	Joint		54	46	0				
	extended		50	50	0				
	Single parent		0	0	0				
4	Religion					0.92	2	5.99	NS
	Hindu		57	43	0				
	Muslim		56	44	0				
	Christian		0	0	0				
	Other		0	0	0				
5	Family income					4.11	6	12.59	NS
	5,000-10,000		60	40	0				
	11,000-20,000		58	42	0				
	21,000-30,000		54	46	0				
	31,000above		56	44	0				
6	Type of residence					2.94	4	9.49	NS
	Hostel		45	55	0				

	Home		65	35	0				
	Rented room		60	40	0				

The table reveals that

- The table presents the chi-square analysis of post-test stress levels in relation to selected socio-demographic variables of the study participants. Post-test stress levels were categorized into mild, moderate, and severe, and their distribution was analyzed across different demographic characteristics to determine any significant association.
- With respect to **age in years**, participants in the age groups 17–20 years, 21–23 years, and 24–26 years predominantly exhibited mild and moderate stress levels, with no participant reporting severe stress. The calculated chi-square value ($\chi^2 = 3.21$) at 4 degrees of freedom was less than the critical value (9.49), indicating no statistically significant association between age and post-test stress level.
- Regarding **gender**, both male and female participants showed similar distributions of mild and moderate stress levels, and none reported severe stress. The obtained chi-square value ($\chi^2 = 1.84$) with 2degrees of freedom was lower than the critical value (5.99), suggesting that gender had no significant association with post-test stress level.
- In terms of **family type**, participants from nuclear, joint, and extended families mainly reported mild and moderate stress levels, while no severe stress was observed. The chi-square value ($\chi^2 = 2.67$) at 4 degrees of freedom was less than the critical value(9.49),indicating no significant relationship between family type and post-test stress level.
- Analysis based on **religion** showed that both Hindu and Muslim participants had comparable proportions of mild and moderate stress levels, with no severe stress reported. The calculated chi-square value ($\chi^2 = 0.92$) at 2 degrees of freedom was lower than the critical value (5.99), revealing no significant association between religion and post-test stress level.
- With regard to **family income**, participants across all in come categories predominantly experienced mild and moderate stress levels, and severe stress was absent in all groups. The chi-square value ($\chi^2 = 4.11$)at6degrees of freedom was less than the critical value (12.59), indicating no statistically significant association between family income and post-test stress level.
- Finally, analysis of **type of residence** (hostel, home, and rented room) revealed that participants mainly reported mild and moderate stress levels ,with no severe stress observed .The calculated chi-square value ($\chi^2 = 2.94$) at 4 degrees of freedom was less than the critical value (9.49), showing no significant association between type of residence and post-test stress level.
- Overall, the findings of the chi-square analysis indicate that there was **no statistically significant association** between post-test stress levels and any of the selected socio-demographic variables, as all calculated chi-square values were less than their respective critical values at the 0.05 level of significance.

LIMITATIONS OF THE STUDY:

- 1) **Single-Centre Study:** Conducted in only one nursing school, which limits the generalize ability of findings to other institutions.
- 2) **Small Sample Size:** Included only 60 participants, which may not represent the entire nursing student population.

- 3) **Study Design Limitation:** Pre-experimental single-group design without a control group, making it difficult to rule out external factors influencing stress reduction.
- 4) **Self-Reported Data:** Stress was measured using a self-report scale, which may have been influenced by participant bias.
- 5) **Lack of Follow-Up:** No long-term follow-up was conducted to determine the sustained effects of deep breathing exercises on stress levels.

NURSING IMPLICATIONS:

The study's findings have significant implications for nursing practice, education, administration, and research.

Nursing Education:

Nursing curricular should integrate deep breathing exercises as a stress management tool, particularly for young students transitioning into clinical environments. This approach can enhance resilience, improve academic performance, and prepare students for the emotional demands of patient care.

Nursing Administration:

Hospital and educational administrators should incorporate regular stress management workshops featuring deep breathing into training schedules, ensuring minimal disruption to clinical duties. Providing quiet spaces and instructional materials (e.g., audio guides) can support consistent practice and foster a supportive learning environment.

Nursing Research:

Future research could explore the long-term effects of deep breathing on stress and clinical outcomes among nursing students. Comparative studies with control groups or longitudinal designs could validate these findings, while investigations into combining deep breathing with other techniques (e.g., mindfulness) could optimize stress reduction strategies.

FURTHER RECOMMENDATIONS:

Recommendations:

- 1) **Larger Sample Size:** Future studies should include a larger, more diverse population to enhance generalize ability.
- 2) **Randomized Controlled Trials:** Conduct RCTs with control groups to provide stronger evidence for the effectiveness of deep breathing exercises.
- 3) **Long-Term Follow-Up:** Include follow-up assessments to evaluate the sustainability of stress reduction over time.
- 4) **Comparative Studies:** Compare deep breathing with other stress management interventions such as mindfulness, yoga, or progressive muscle relaxation.
- 5) **Integration into Curriculum:** Incorporate structured stress management programs, including deep breathing exercises, into nursing curricula.
- 6) **Faculty and Peer Support:** Train faculty to recognize students under stress and provide counselling and support services within the institution.

This structured discussion underscores the effectiveness of deep breathing exercises in reducing stress among nursing students, aligning with evidence-based practices to enhance well-being and performance, while identifying avenues for future research to broaden these insights.

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