

Effectiveness of Breathing Exercises on Perceived Stress Among First-Year B.Sc. Nursing Students: A Quasi-Experimental Study

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Abstract: Background: B.Sc. Nursing students frequently encounter elevated stress levels stemming from demanding academic workloads, clinical responsibilities, and examination pressures. Simple, cost-effective non-pharmacological interventions like breathing exercises may serve as effective coping mechanisms. Objectives: To assess baseline stress levels, evaluate the impact of a structured breathing exercise intervention on post-test stress levels, compare outcomes between experimental and control groups, and examine associations between baseline stress and selected demographic variables. Methods: A quantitative, quasi-experimental pre-test–post-test control group design was conducted among 100 first-year B.Sc. Nursing students selected via purposive sampling in Madurai ($N = 50$ Experimental, $N = 50$ Control). Stress levels were measured using the standard Perceived Stress Scale (PSS) prior to and following the intervention. Data were analyzed using paired t -tests and Chi-square statistics. Results: In the experimental group, the mean pre-test stress score was 20.27 ± 3.29 , which significantly decreased to 10.55 ± 6.19 post-intervention ($t = 9.81, p < 0.05$). In contrast, the control group exhibited no significant change between pre-test (19.19 ± 4.19) and post-test scores ($19.19 \pm 4.99; t = 0.00, p > 0.05$). Conclusion: Breathing exercises are a highly effective, safe, and economical strategy for reducing perceived stress among nursing students. Incorporating routine practice into nursing curricula can enhance emotional well-being and academic performance.

Keywords: Breathing Exercises, Perceived Stress Scale, Nursing Students, Academic Stress, Quasi-Experimental Design

1. Introduction

Adolescence and young adulthood represent crucial transitional stages characterized by rapid physical, psychological, and social development. Nursing students—particularly first-year undergraduates—are disproportionately susceptible to psychological stress due to rigorous academic pressures, demanding clinical postings, patient care duties, and emotionally intense clinical environments. The World Health Organization emphasizes that stress, anxiety, and depressive symptoms among healthcare students constitute a growing global public health issue.

Breathing exercises stimulate parasympathetic activity, dampen sympathetic nervous system stimulation, and optimize oxygen exchange, thereby mitigating the physiological impact of acute and chronic stress. Implementing low-cost, evidence-based self-care practices in educational settings is vital to supporting student mental health.

2. Objectives & Hypotheses

2.1 Objectives

- 1) To assess baseline (pre-test) stress levels among first-year B.Sc. Nursing students.
- 2) To evaluate the effectiveness of breathing exercises in reducing stress among students in the experimental group.
- 3) To compare post-test stress levels between the experimental and control groups.
- 4) To identify associations between pre-test stress levels and selected socio-demographic variables.

2.2 Hypotheses

- **H0:** There is no statistically significant difference between pre-test and post-test stress scores among B.Sc. Nursing students following the practice of breathing exercises.
- **H1:** There is a statistically significant difference in post-test stress scores between the experimental and control groups.
- **H2:** There is a statistically significant association between baseline stress levels and selected demographic variables (e.g., age, gender, family structure, parental education, income, and study habits).

3. Research Methodology

Study Design & Setting: A quantitative quasi-experimental pre-test–post-test control group design conducted at selected nursing colleges in Madurai, **Population & Sample Size:** First-year B.Sc. Nursing students ($N = 100$) meeting eligibility criteria were recruited via purposive sampling and allocated equally into two groups: **Experimental Group:** $N = 50$ (Received breathing exercise intervention) **Control Group:** $N = 50$ (Received routine daily activities/no intervention) **Measurement Instrument:** Perceived Stress Scale (PSS) administered before and after the intervention period. **Statistical Analysis:** Data were organized and analyzed using SPSS/descriptive statistics (frequencies, percentages, means, standard deviations) and inferential statistics (paired t -tests for pre/post intervention comparisons and Chi-square tests for categorical associations).

4. Results

4.1 Stress Level Comparisons

The experimental group demonstrated a substantial, statistically significant decrease in perceived stress post-intervention, whereas the control group showed no significant change.

Key Finding: The paired t -test score of \$9.81\$ (\$p < 0.05\$) in the experimental group supports the rejection of the null hypothesis (\$H_0\$), confirming that breathing exercises effectively decrease perceived stress.

5. Discussion

The findings demonstrate that simple breathing interventions significantly reduce perceived stress among undergraduate nursing students. The baseline stress scores in both groups reflected moderate stress levels typical of entry-level health professional students adapting to clinical and academic challenges.

The drastic score reduction in the intervention group (\$20.27 \rightarrow 10.55\$) aligns with physiological mechanisms: voluntary slow deep breathing enhances vagal tone, increases arterial oxygen saturation, decreases heart rate variability, and shifts autonomic activation away from sympathetic arousal. These results corroborate findings by Ma et al. (2017), Paul & Elam (2008), and Thomas et al. (2024), highlighting breathing routines as reliable self-care measures in nursing education.

6. Conclusion

Breathing exercises are a safe, highly effective, non-pharmacological, and cost-free practice for alleviating stress among first-year B.Sc. Nursing students. Incorporating structured relaxation and deep-breathing modules into orientation programs and daily routines can improve emotional resilience, mental well-being, and overall academic performance.

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