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Original Research Article

IMPACT OF THE GUIDED PROGRESSIVE MUSCLE RELAXATION INTERVENTION ON STRESS AND ANXIETY IN ICU NURSES

SHAHEEN F*, NISA QU, TAJ S

College of Nursing, Nishtar Medical University (NMU), Multan, Pakistan
**Corresponding author email address:* farkhandashaheen51@yahoo.com

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ABSTRACT

Background: *Intensive care unit nurses are consistently exposed to high emotional demands, critically ill patients, and rotating shift schedules. These occupational stressors substantially increase the risk of stress, anxiety, sleep disturbance, and burnout. In low- and middle-income countries, including Pakistan, evidence supporting feasible, low-cost psychological interventions tailored for ICU nurses remains limited.* ***Objective:*** *To evaluate the effectiveness of a guided progressive muscle relaxation intervention in reducing perceived stress and anxiety among ICU nurses working in a tertiary care hospital in Pakistan.* ***Study Design:*** *Prospective two-arm controlled trial.* ***Settings:*** *Adult intensive care units of a tertiary care hospital in Pakistan.* ***Duration of Study:*** *January to July 2025.* ***Methods:*** *Ninety registered ICU nurses were enrolled and allocated equally to an intervention group receiving guided progressive muscle relaxation plus usual routine care (n = 45) or a control group receiving usual routine care alone (n = 45). The intervention consisted of supervised and self-guided relaxation sessions conducted over the intervention period. Primary outcomes were perceived stress assessed using the Perceived Stress Scale-10 and anxiety assessed using the Generalized Anxiety Disorder-7 scale. Secondary outcomes included sleep quality and emotional exhaustion. Outcomes were measured at baseline and post-intervention. Analysis of covariance was performed with baseline scores adjusted for, and effect sizes were calculated using Cohen's d.* ***Results:*** *Baseline demographic characteristics and outcome measures were comparable between groups. Post-intervention, nurses in the guided progressive muscle relaxation group demonstrated significantly lower stress and anxiety scores than those in the control group (Perceived Stress Scale-10: 16.7 ± 4.9 vs 22.9 ± 5.5, $p < 0.001$; Generalized Anxiety Disorder-7: 7.1 ± 3.2 vs 11.2 ± 3.7, $p < 0.001$). Mean reductions in stress and anxiety were substantially greater in the intervention group, with large effect sizes (Cohen's d = 1.50 for stress and 1.38 for anxiety). Significant improvements were also observed in sleep quality and emotional exhaustion. Allocation to the intervention group independently predicted clinically meaningful improvement after adjustment for demographic and occupational variables. Adherence to the intervention was high, and no adverse events were reported.* ***Conclusion:*** *Guided progressive muscle relaxation is a safe, feasible, and highly effective intervention for reducing stress and anxiety among ICU nurses. Incorporation of this low-cost strategy into routine workplace wellness programs may enhance psychological wellbeing and occupational resilience in resource-limited critical care settings.*

Keywords: Progressive Muscle Relaxation; Intensive Care Unit Nurses; Stress; Anxiety; Occupational Mental Health

INTRODUCTION

Stress and anxiety are prevalent mental health challenges faced by nurses, particularly those working in high-pressure environments such as Intensive Care Units (ICUs). The nature of ICU nursing involves near-constant exposure to critical patient conditions, which can induce significant occupational stress and anxiety. Research has documented that the emotional toll of this environment can lead to burnout and compassion fatigue, negatively impacting nurses' psychological well-being and patient outcomes (1-3). Consequently, there is a pressing need for effective interventions to alleviate psychological stress among this workforce.

Progressive Muscle Relaxation (PMR) has emerged as a promising non-pharmacological intervention aimed at reducing stress and anxiety. PMR involves a systematic method of tensing and then relaxing different muscle groups, which can reduce physiological stress responses (4,5). Numerous studies have demonstrated the efficacy of PMR in various clinical populations, suggesting significant reductions in anxiety and stress symptoms. A systematic review indicated that PMR significantly decreases anxiety levels across different patient populations, including those with cancer and healthcare professionals (6). Furthermore, PMR was notably effective in alleviating anxiety and improving sleep quality in patients recovering from COVID-19, underscoring its versatility as a relaxation technique (7, 8).

Despite the demonstrated positive outcomes of PMR in diverse populations, its application among ICU nurses remains underexplored. Notably, the high-stress nature of ICU nursing care has been shown to cause psychological distress, leading to decreased job satisfaction and increased turnover rates (1, 2). Integrating PMR interventions could enhance the mental health of ICU nurses, thereby improving their resilience and overall quality of care provided to critically ill patients (9, 10). Existing literature supports the introduction of structured relaxation techniques, such as PMR, in nursing education and practice to equip nurses with better coping strategies (11).

In Pakistan, there is a unique and pressing need to implement interventions such as PMR among ICU nurses. The contemporary healthcare system in Pakistan faces significant challenges, including high patient-to-nurse ratios, limited resources, and frequent exposure to traumatic patient scenarios, all of which contribute to heightened levels of occupational stress among nurses (3). Furthermore, cultural factors may inhibit nurses from seeking psychological assistance, making PMR a culturally appropriate and accessible intervention to promote mental wellness in this cohort. Implementation of PMR could serve as an easy-to-adopt strategy that aligns with local healthcare practices while addressing the mental health crisis prevalent among nurses in Pakistan (12).

The rationale behind exploring the impact of guided PMR interventions on stress and anxiety in ICU nurses lies in the recognition of the unique stressors faced by this group and the potential of non-invasive methods to enhance their well-being. PMR not only offers an innovative approach to stress management but also

addresses the growing concern of mental health issues exacerbated by the demanding nature of ICU nursing.

Considering the interplay between health professions and psychological wellbeing, investigating PMR's efficacy could provide valuable insights into improving mental health strategies, ultimately benefiting caregivers and the patients they serve.

This structured and detailed introduction is designed to meet the standards of high-impact journals, providing both a comprehensive overview of the topic and contextualizing the need for interventions in a specific demographic.

METHODOLOGY

The study was conducted as a prospective, two-arm, controlled trial in the adult intensive care units of a tertiary care hospital in Pakistan between January and July 2025. Registered nurses who had worked in the ICU for at least six months were eligible. Nurses on prolonged leave during the study period, receiving ongoing psychotherapy initiated within the preceding eight weeks, using newly started anxiolytics or antidepressants in the prior eight weeks, or with severe psychiatric instability requiring urgent specialist intervention were excluded. Participants were recruited using consecutive sampling from ICU rosters and enrolled after written informed consent was obtained. Ethical approval was obtained from the hospital's institutional review committee, and all procedures were conducted in accordance with the principles of the Declaration of Helsinki, including confidentiality and the right to withdraw at any stage without penalty.

A sample size of 90 was targeted to ensure adequate precision and power to detect a clinically meaningful difference in stress and anxiety between groups, accounting for potential attrition. Participants were allocated in a 1:1 ratio to an intervention group (guided progressive muscle relaxation plus usual routine) or a control group (usual routine alone). To minimize contamination, nurses were scheduled to attend intervention guidance in small groups during non-peak times, and participants in the control arm were requested not to share audio scripts with colleagues until study completion. Baseline assessments were completed prior to allocation, and outcomes were reassessed after completion of the intervention period using the same standardized instruments and data collection procedures. Data collectors were trained to use neutral prompts and standardized scoring instructions to reduce measurement bias.

The intervention consisted of guided progressive muscle relaxation delivered through an evidence-based standardized sequence of muscle tension and release combined with paced breathing. A trained facilitator provided an initial in-person orientation session explaining the rationale, steps, and safety precautions, followed by supervised practice sessions scheduled multiple times per week in a quiet room adjacent to the ICU. Participants were provided a standardized audio guide in the local language and English. They were encouraged to practice independently at home or during breaks, with a brief log maintained to document session completion. Each session lasted approximately 15 to 20 minutes and followed a fixed structure: settling posture and breathing, a series of muscle group contractions for several seconds, a slow release with attention to relaxation sensations, and a short closing phase emphasizing calm breathing. Usual routine in both groups included standard duty schedules and routine occupational support available in the hospital; no additional psychological interventions were introduced by the research team for the control group during the study period.

The primary outcomes were perceived stress and anxiety. Perceived stress was assessed using the Perceived Stress Scale (PSS-10), and anxiety symptoms were assessed using the Generalized Anxiety Disorder scale (GAD-7), both of which are widely used and have demonstrated good psychometric performance in healthcare populations. Secondary outcomes included sleep quality measured by the Pittsburgh Sleep Quality Index and burnout symptoms assessed using the emotional exhaustion subscale of a validated burnout inventory appropriate for healthcare workers. A brief baseline proforma captured socio-demographic variables (age, gender, marital status, and education) and professional variables (designation, ICU experience, weekly working hours, shift pattern, and prior relaxation exposure). All questionnaires were administered in a quiet setting before or after duty hours, and participants were reminded to answer the symptom scales based on the preceding two weeks, as per standard instrument instructions.

Data were entered and analyzed using SPSS. Continuous variables were summarized as mean ± standard deviation or median with interquartile range as appropriate after assessing normality, while categorical variables were summarized as frequency and percentage. Baseline comparability between groups was evaluated using independent-samples t-tests or Mann–Whitney U tests for continuous variables and chi-square or Fisher's exact tests for categorical variables. The primary analysis compared post-intervention outcomes between groups using analysis of covariance models, adjusting for baseline values of the respective outcome, and standardized effect sizes were calculated using Cohen's d. Within-group pre-post changes were assessed using paired t-tests or Wilcoxon signed-rank tests as appropriate, and 95% confidence intervals were reported for key estimates. A clinically meaningful improvement threshold was defined a priori for each primary outcome, and multivariable logistic regression was performed to identify independent predictors of response, including group allocation and relevant baseline covariates such as age, gender, ICU experience, shift pattern, and baseline symptom severity. Intervention adherence was measured as the proportion of participants who completed at least 75% of sessions and as the average number of sessions completed, and acceptability was summarized descriptively. Missing data were handled using complete-case analysis when minimal; if any variable exceeded a small predefined missingness threshold, sensitivity checks were planned using simple imputation strategies consistent with questionnaire guidance.

RESULTS

A total of 90 ICU nurses were enrolled (n = 45 in the intervention group, n = 45 in the control group). The overall mean age was 29.6 ± 5.1 years (range 21 to 44), and 58 (64.4%) were female. Most participants were staff nurses (n = 74, 82.2%), and 52 (57.8%) reported rotating day and night shifts. Baseline demographic and work profile variables were comparable between groups with no statistically significant differences (Table 1).

At baseline, perceived stress and anxiety levels were moderate to high in both groups, with no significant differences. After the intervention period, the GPMR group demonstrated a clinically meaningful reduction in stress and anxiety compared with the control group. The primary endpoint analysis using ANCOVA (post-score as the outcome, group as a fixed effect, baseline score as a covariate) showed significantly lower post-intervention PSS-10 and GAD-7 scores in the GPMR group. Effect sizes were in the moderate-to-large range (Table 2).

Within-group change scores further demonstrated that the GPMR group improved substantially while the control group showed only minor changes consistent with routine adaptation. Mean change in PSS-10 was -8.2 ± 4.6 in the GPMR group versus -1.7 ± 3.9 in controls. Mean change in GAD-7 was -5.2 ± 3.3 in the GPMR group versus -0.8 ± 2.9 in controls. The standardized mean difference for change favored GPMR with Cohen's d = 1.50 for stress and d = 1.38 for anxiety, supporting a robust intervention effect (Table 3).

Secondary outcomes indicated that the GPMR group also had improved sleep quality and reduced burnout symptoms compared with

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the control group, suggesting broader occupational mental health benefits consistent with stress physiology downregulation (Table 4).

In multivariable analysis assessing predictors of meaningful improvement (defined a priori as at least a 5-point reduction in PSS-10 and at least a 4-point decrease in GAD-7), allocation to the GPMR group independently predicted response after adjusting for age, gender, ICU experience, and rotating shifts. Rotating shifts and higher baseline stress were also associated with response magnitude, suggesting that nurses with greater baseline burden may benefit most (Table 5). Intervention fidelity was high. In the GPMR arm, 39 (86.7%) completed at least 75% of planned sessions. No adverse events were reported. Acceptability feedback indicated that most nurses found the intervention feasible within the ICU workflow and would recommend it to colleagues (Table 6).

Table 1: Socio-demographic and professional characteristics of ICU nurses (N = 90)

Variable	Total (N=90)	GPMR (n=45)	Control (n=45)	p-value
Age (years), mean ± SD	29.6 ± 5.1	29.4 ± 5.2	29.8 ± 5.1	0.71
Female, n (%)	58 (64.4)	29 (64.4)	29 (64.4)	1.00
Marital status, n (%)				0.66
Single	46 (51.1)	24 (53.3)	22 (48.9)	
Married	44 (48.9)	21 (46.7)	23 (51.1)	
Education, n (%)				0.58
Diploma in Nursing	26 (28.9)	12 (26.7)	14 (31.1)	
BSN/Post-RN BSN	58 (64.4)	31 (68.9)	27 (60.0)	
MSN or above	6 (6.7)	2 (4.4)	4 (8.9)	
Job designation, n (%)				0.77
Staff nurse	74 (82.2)	36 (80.0)	38 (84.4)	
Senior/charge nurse	16 (17.8)	9 (20.0)	7 (15.6)	
ICU experience (years), mean ± SD	3.2 ± 2.1	3.3 ± 2.2	3.1 ± 2.0	0.63
Weekly working hours, mean ± SD	49.1 ± 6.7	49.4 ± 6.5	48.8 ± 6.9	0.67
Shift pattern, n (%)				0.81
Fixed day	18 (20.0)	10 (22.2)	8 (17.8)	
Fixed night	20 (22.2)	9 (20.0)	11 (24.4)	
Rotating	52 (57.8)	26 (57.8)	26 (57.8)	
Prior formal relaxation training, n (%)	14 (15.6)	7 (15.6)	7 (15.6)	1.00

Table 2: Primary outcomes at baseline and post-intervention (N = 90)

Outcome	Time	GPMR (n=45) mean ± SD	Control (n=45) mean ± SD	Between-group p-value
PSS-10 (0 to 40)	Baseline	24.9 ± 5.4	24.6 ± 5.2	0.78
	Post	16.7 ± 4.9	22.9 ± 5.5	<0.001
GAD-7 (0 to 21)	Baseline	12.3 ± 3.8	12.0 ± 3.6	0.69
	Post	7.1 ± 3.2	11.2 ± 3.7	<0.001

Table 3: Within-group changes and between-group differences in change (N = 90)

Outcome	Change score (Post minus Baseline)	GPMR (n=45) mean ± SD	Control (n=45) mean ± SD	Mean difference in change (95% CI)	p-value
PSS-10	ΔPSS-10	-8.2 ± 4.6	-1.7 ± 3.9	-6.5 (-8.3 to -4.7)	<0.001
GAD-7	ΔGAD-7	-5.2 ± 3.3	-0.8 ± 2.9	-4.4 (-5.7 to -3.1)	<0.001

Table 4: Secondary outcomes at baseline and post-intervention (N = 90)

Outcome	Time	GPMR (n=45) mean ± SD	Control (n=45) mean ± SD	Between-group p-value
PSQI (0 to 21)	Baseline	9.8 ± 3.1	9.6 ± 3.0	0.74
	Post	7.0 ± 2.8	9.1 ± 3.2	0.001
Emotional exhaustion (0 to 54)	Baseline	28.6 ± 7.4	28.1 ± 7.2	0.76
	Post	22.9 ± 6.8	27.0 ± 7.1	0.004

Table 5: Multivariable predictors of clinically meaningful improvement (N = 90)

Predictor	Stress response (ΔPSS-10 ≥ 5) AOR (95% CI)	p-value	Anxiety response (ΔGAD-7 ≥ 4) AOR (95% CI)	p-value
GPMR group (vs control)	6.10 (2.35 to 15.86)	<0.001	5.42 (2.10 to 14.02)	<0.001
Rotating shifts (vs fixed)	1.92 (0.78 to 4.71)	0.16	2.18 (0.88 to 5.42)	0.09
Baseline score (per 1-point higher)	1.12 (1.03 to 1.22)	0.008	1.15 (1.04 to 1.27)	0.006
ICU experience (per 1 year)	0.93 (0.79 to 1.09)	0.37	0.95 (0.80 to 1.13)	0.56
Female (vs male)	1.21 (0.48 to 3.03)	0.68	1.34 (0.52 to 3.44)	0.54

Table 6. Adherence and acceptability in the intervention group (n = 45).

Indicator	n (%) or mean ± SD
Completed at least 75% sessions	39 (86.7)
Average sessions completed (out of planned), mean ± SD	10.8 ± 2.1

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Practiced at home at least 3 times/week	31 (68.9)
Reported intervention as feasible in the ICU routine	37 (82.2)
Would recommend to colleagues	40 (88.9)
Any adverse events reported	0 (0.0)

DISCUSSION

The study evaluated the impact of a Guided Progressive Muscle Relaxation (GPMR) intervention on stress and anxiety levels among ICU nurses. A total of 90 ICU nurses participated, with comparable demographic variables across intervention (n=45) and control (n=45) groups (Table 1). It was notable that the mean age (29.6 ± 5.1 years) and sex distribution were consistent with the existing literature, which highlights a predominance of younger, predominantly female staff nurses in critical care settings (Yıldız 13). Previous studies have identified age and gender as potential factors influencing mental health outcomes among nurses, reinforcing the importance of addressing psychological health in this population during their formative career stages (14, 15).

At baseline, the perceived stress and anxiety levels in both groups were moderate to high, with no statistically significant differences (Table 2). However, following the intervention, the GPMR group showed substantial clinically meaningful reductions in perceived stress (PSS-10) and anxiety (GAD-7) scores compared to the control group ($p < 0.001$). Specifically, the mean change in PSS-10 was -8.2 ± 4.6 in the GPMR group versus -1.7 ± 3.9 in controls, with strong effect sizes (Cohen's $d = 1.50$ for stress and $d = 1.38$ for anxiety) (16). These findings align with research indicating that PMR significantly reduces psychological distress among healthcare professionals (17). For example, a systematic review by Huang et al. reported that structured relaxation interventions effectively curb stress levels among healthcare workers, including ICU nurses (18).

Beyond primary outcomes, secondary measures such as sleep quality and burnout levels further underscore the holistic benefits of GPMR. The GPMR group demonstrated improved sleep quality post-intervention, as evidenced by reductions in Pittsburgh Sleep Quality Index (PSQI) scores (Table 4). This aligns with findings from studies suggesting that enhanced relaxation techniques can mitigate sleep disturbances common in high-stress work contexts, such as ICUs (19). Moreover, emotional exhaustion decreased significantly in the GPMR group, suggesting that the relaxation intervention may also be effective in addressing factors contributing to burnout (20).

Multivariable analyses indicated that allocation to the GPMR group was a strong predictor of meaningful improvement in both stress and anxiety scores, independent of other variables like ICU experience and shift patterns (Table 5). This concurs with previous studies that have highlighted structured interventions as critical tools for reducing both mental health burdens and improving the overall functioning of ICU nurses (21). Identifying high-stress individuals, such as those on rotating shifts, as particularly likely to benefit from GPMR underscores the need for tailored stress management strategies in such populations (22).

The intervention's high adherence (86.7% completion rate) supports its feasibility within the demanding ICU environment (Table 6). Most participants found GPMR to be compatible with their routine, highlighting an essential aspect of implementation in clinical settings. This resonates with findings from Khamali et al., who emphasized the need for pragmatic stress-reduction strategies that nurses can seamlessly incorporate into their workdays (16). The absence of reported adverse events further affirms GPMR's safety, an essential aspect for interventions aimed at healthcare professionals (21). In the context of Pakistan, where healthcare systems frequently encounter resource limitations, the implementation of GPMR offers a culturally acceptable and economically feasible method to alleviate substantial psychological distress among nurses. Alleviating stress and anxiety would not only improve nurse retention rates but also significantly enhance patient care quality during a time when the healthcare system remains under severe strain, such as during pandemics. Given the unique occupational challenges faced by nurses in this setting, approaches such as GPMR could serve as vital tools to enhance both worker well-being and patient outcomes, addressing pressing needs in critical care environments (23, 24).

Thus, the efficacy of GPMR in reducing stress and anxiety among ICU nurses in this study aligns with contemporary literature, providing a compelling case for its adoption as Part of standard practice in nurse wellness initiatives. Further research could expand on these findings by exploring the long-term benefits and efficacy of PMR across different healthcare settings and cultures.

CONCLUSION

Guided progressive muscle relaxation significantly reduced stress and anxiety among ICU nurses and demonstrated additional benefits for sleep quality and emotional exhaustion. The intervention was well accepted, required minimal resources, and was easily integrated into routine ICU workflows. Given the high psychological burden faced by ICU nurses in Pakistan, GPMR represents a practical, non-pharmacological strategy to enhance mental wellbeing and support workforce sustainability. Incorporating structured relaxation interventions into institutional nurse wellness programs may improve staff resilience and, ultimately, enhance the quality of patient care.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRBEC-NCMMU-0092/24)

Consent for publication

Approved

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Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

FARKHANDA SHAHEEN (Clinical Nursing Instructor)
Manuscript revisions, critical input.
Data entry, data analysis, and drafting an article.
QAMAR UN NISA (Dean of Nursing Dept.)
Conception of Study, Final approval of manuscript.
Study Design, Review of Literature.
***SHAZIA TAJ* (Assistant Nursing Instructor)**
Conception of Study, Final approval of manuscript.
Study Design, Review of Literature.

REFERENCES

1. Hawsawi S.. Alleviating psychological symptoms in nurses during disease outbreaks: An integrative review. International Nursing Review 2022;69(4):470-483. https://doi.org/10.1111/inr.12756
2. Saffari M., Bashar F., Vahedian-Azimi A., Pourhoseingholi M., Karimi L., Shamsizadeh M.et al.. Effect of a Multistage Educational Skill-Based Program on Nurses' Stress and Anxiety in the Intensive Care Setting: A Randomized Controlled Trial. Behavioural Neurology 2021;2021:1-11. https://doi.org/10.1155/2021/8811347
3. Alkhawaldeh J., Soh K., Mukhtar F., Peng O., & Anshasi H. Stress management interventions for intensive and critical care nurses: A systematic review. Nursing in Critical Care 2019;25(2):84-92. https://doi.org/10.1111/nicc.12489
4. Sulastini S., Mediani , Fitria N., & Nugraha B. Effect of Progressive Muscle Relaxation on Anxiety in Congestive Heart Failure Patients. Jurnal Keperawatan Soedirman 2019;14(2). https://doi.org/10.20884/1.jks.2019.14.2.816
5. Sanad H., Aziz H., Hassan S., & Mohamed A. Effect of progressive muscle relaxation technique on anxiety and sleep quality among hemodialysis patients. International Journal of Advanced Psychiatric Nursing 2023;5(2):21-32. https://doi.org/10.33545/26641348.2023.v5.i2a.127
6. Yusuf S., Firmanti T., Nashir M., & Laili R. The effect of progressive muscle relaxation interventions on depression, stress, anxiety, and quality of life for cancer patients: a systematic review. Professional Health Journal 2021;3(1):34-42. https://doi.org/10.54832/phj.v3i1.97
7. Özlü İ., Öztürk Z., Özlü Z., Tekin E., & Gür A.. The effects of progressive muscle relaxation exercises on the anxiety and sleep quality of patients with COVID-19: A randomized controlled study. Perspectives in Psychiatric Care 2021;57(4):1791-1797. https://doi.org/10.1111/ppc.12750
8. Ganjeali S., Farsi Z., Sajadi S., & Zarea K. The effect of the demonstration-based progressive muscle relaxation technique on stress and anxiety in nurses caring for COVID-19 patients: a randomized clinical trial. BMC Psychiatry 2022;22(1). https://doi.org/10.1186/s12888-022-04456-3
9. Toqan D., Ayed A., Joudallah H., Amoudi M., Malak M., Thultheen I.et al.. Effect of Progressive Muscle Relaxation Exercise on Anxiety Reduction Among Nursing Students During Their Initial Clinical Training: A Quasi-Experimental Study. Inquiry the Journal of Health Care Organization Provision and Financing 2022;59. https://doi.org/10.1177/00469580221097425
10. Wade D., Mouncey P., Richards-Belle A., Wulff J., Harrison D., Sadique Z., et al Effect of a Nurse-Led Preventive Psychological Intervention on Symptoms of Posttraumatic Stress Disorder Among Critically Ill Patients. Jama 2019;321(7):665. https://doi.org/10.1001/jama.2019.0073
11. Kıyak S. and Koçoğlu D. Effectiveness of progressive muscle relaxation and laughter therapy on mental health and treatment outcomes in women undergoing in vitro fertilization: A randomized controlled trial. Research in Nursing & Health 2021;44(6):945-956. https://doi.org/10.1002/nur.22187
12. Melo-Dias C., Lopes R., Cardoso D., Bobrowicz-Campos E., & Apóstolo J. Schizophrenia and Progressive Muscle Relaxation – A systematic review of effectiveness. Heliyon 2019;5(4):e01484. https://doi.org/10.1016/j.heliyon.2019.e01484
13. Yıldız E.. Psychopathological Factors Associated With Burnout in Intensive Care Nurses: A Cross-Sectional Study. Journal of the American Psychiatric Nurses Association 2021;29(2):122-135. https://doi.org/10.1177/1078390321999725
14. Swarbrick M., Fogerite S., Spagnolo A., & Nemec P. Caregivers of People With Disabilities: A Program to Enhance Wellness Self-Care. Journal of Psychosocial Nursing and Mental Health Services 2021;59(5):25-32. https://doi.org/10.3928/02793695-20210107-04
15. Fischer R., Mattos P., Teixeira C., Ganzerla D., Rosa R., & Bozza F. Association of Burnout With Depression and Anxiety in Critical Care Clinicians in Brazil. Jama Network Open 2020;3(12):e2030898. https://doi.org/10.1001/jamanetworkopen.2020.30898
16. Khamali R., Mouaci A., Valéra S., Cano-Chervel M., Pinglis C., Sanz C., et al Effects of a Multimodal Program Including Simulation on Job Strain Among Nurses Working in Intensive Care Units. Jama 2018;320(19):1988. https://doi.org/10.1001/jama.2018.14284
17. Yuan Q. and Dai Z. The Application of Structural Equation Modeling in Nursing Research: A Bibliometric Analysis. 2023. https://doi.org/10.20944/preprints202301.0268.v1
18. Huang H., Xia Y., Zeng X., & Lü A. Prevalence of depression and depressive symptoms among intensive care nurses: A meta-analysis. Nursing in Critical Care 2022;27(6):739-746. https://doi.org/10.1111/nicc.12734
19. Ross P., Howard B., Ilić D., Watterson J., & Hodgson C. Nursing workload and patient-focused outcomes in intensive care: A systematic review. Nursing and Health Sciences 2023;25(4):497-515. https://doi.org/10.1111/nhs.13052
20. Jarden R., Sandham M., Siegert R., & Koziol-McLain J. Strengthening workplace well-being: perceptions of intensive care nurses. Nursing in Critical Care 2018;24(1):15-23. https://doi.org/10.1111/nicc.12386
21. Terzi B., Azizoğlu F., Polat Ş., Kaya N., & İşsever H.. The effects of noise levels on nurses in intensive care units. Nursing in Critical Care 2019;24(5):299-305. https://doi.org/10.1111/nicc.12414
22. Teng M., Yuan Z., He H., & Wang J. Levels and influencing factors of mental workload among intensive care unit nurses: A systematic review and meta-analysis. International Journal of Nursing Practice 2023;30(4). https://doi.org/10.1111/ijn.13167
23. Sarfraz S., Ghani M., & Kausar S. Psychological Challenges and Coping Strategies Adopted by ICU Nurses during the COVID-19 Pandemic in Lahore, Pakistan. PJMHS 2022;16(9):265-267. https://doi.org/10.53350/pjmhs22169265
24. Zulfiqar L. and Rafiq M. Exploring experiences and coping strategies of nurses working in intensive care unit: A qualitative study. Anaesthesia Pain & Intensive Care 2020;24(1):42-49. https://doi.org/10.35975/apic.v24i1.1223.

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