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OCCUPATIONAL STRESS AND ASSOCIATED FACTORS AMONG HOSPITAL NURSES

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ABSTRACT

Background: Nursing is a profession with high physical and psychological demands, making nurses vulnerable to occupational stress, which may affect both their health and the quality of patient care.

Objective: To assess the level of occupational stress and identify associated factors among nurses at several hospitals in Can Tho City, Vietnam.

Methods: A cross-sectional descriptive study was conducted on 267 nurses using an electronic questionnaire (Google Forms) from July to August 2025. Statistical analyses included descriptive statistics (frequencies, means, and standard deviations) and logistic regression to identify associated factors.

Results: The 12-item stress scale demonstrated excellent internal consistency (Cronbach's Alpha = 0.96). The mean stress score was 41.8 ± 15.0. The highest stressors were "occupational health problems" (3.85 ± 1.57), "lack of time for family" (3.72 ± 1.46), and "work-related fatigue" (3.70 ± 1.59). Stress levels were classified as mild in 37.4% of nurses, moderate in 37.1%, severe in 23.2%, and absent in only 2.3%. Significant demographic factors associated with stress included self-reported health status, having children, and being a single parent ($p < 0.05$). Significant work-related factors were the working department and daily working hours ($p < 0.05$).

Conclusion: Most nurses experienced moderate to high levels of occupational stress, particularly related to workload, insufficient family time, and occupational health issues. Interventions at both organizational and individual levels are needed to support nurses' physical and mental health and to improve the working environment.

Keywords: Occupational stress, nurses, hospital.

1. INTRODUCTION

Work-related stress can be defined as adverse emotional and physical reactions that occur when job demands are not compatible with the worker's abilities, resources, or needs. In other words, it can be described as the interaction between the work environment and worker characteristics, along with additional job demands and related pressures that prevent workers from fulfilling their tasks [1]. Occupational stress is one of the main factors that can reduce organizational productivity and cause both physical and psychological complications. It not only harms workers' physical and mental health but also leads to economic losses for enterprises and society [2].

Healthcare professionals, due to their responsibility for patient care, are exposed to various stressors [3]. Prolonged occupational stress may result in burnout, decreased productivity, increased medical errors, and negative impacts on mental health [4]. International studies have reported that the prevalence of stress among nurses ranges from 30% to 70%, depending on the context. According to a survey by Le Thi Thanh Xuan, 47.83% of healthcare workers experienced psychological stress in two hospitals in Hanoi in 2023, with 10.83% being classified as very stressed or extremely stressed [5].

In Vietnam, research on this topic remains limited. Therefore, we conducted this study to assess the level of stress among nurses in hospitals in Vietnam, using the 12-

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item scale developed by Mary Theresa Steinhoff [6]. This study examines occupational stress and the health status of nurses in hospitals by analyzing demographic and occupational characteristics of healthcare workers. It provides a theoretical reference for managers to implement comprehensive measures to enhance nurses' motivation and job stability.

2. SUBJECTS AND METHODS

2.1. Study subjects

The study population consisted of nurses working at public and private hospitals in Can Tho City.

Inclusion criteria: Nurses who had been working for at least six months and consented to participate in the survey.

2.2. Study design: A cross-sectional descriptive study.

2.3. Sample size: The sample size was estimated using the formula for a single proportion:

$$n = Z^2_{1-\alpha/2} \frac{p(1-p)}{d^2}$$

Where: n = required sample size; α = 0.05 (level of significance); d = 0.06 (desired precision); $Z_{1-\alpha/2}$ = 1.96 (standard normal value corresponding to the selected α); p = 0.4783 (estimated prevalence of stress among nurses, based on the study by Le Thi Thanh Xuan[5]). Substituting values into the formula yielded n = 267.

2.4. Sampling method

Data collection tool: The 12-item Emergency Nurse Stress Questionnaire (ENSQ-12) developed by Mary Theresa Steinhoff [6]. This scale uses a 7-point Likert format (1 = not stressful at all → 7 = very stressful). The instrument was translated into Vietnamese, and its reliability was tested (Cronbach's alpha).

Data collection procedure: Convenience sampling was applied through an online survey. A Google Forms questionnaire link was distributed to nurses in hospitals in Cần Thơ. Participation was voluntary, and responses were recorded electronically.

2.5. Study content

Assessment of nurses' stress: The total score of the 12-item stress scale ranges from 12 to 84 points. Stress levels were classified into four groups based on the mean score: None (mean = 1), Low (mean < 3), Moderate (3–4.9), and High (≥ 5).

Associated factors: Demographic and occupational characteristics, including gender, age, economic status, marital status, health classification, years of work experience, and department of employment.

2.6. Data management and analysis

Data were entered into Excel and analyzed using SPSS version 22.0. Scale reliability was assessed with Cronbach's alpha. Demographic, occupational characteristics, and stress prevalence were described using frequencies and percentages. Associations between factors and occupational stress were analyzed using odds ratios (OR) and chi-square (χ^2) tests. A p-value < 0.05 was considered statistically significant.

2.7. Ethical considerations

Participants were informed of the study objectives, procedures, and benefits. Anonymity was ensured, and participants retained the right to withdraw without consequences. Informed consent was obtained online before survey participation.

3. RESULTS

3.1. Occupational stress among nurses

The level of stress was measured using a 12-item scale, with each item rated on a 7-point Likert scale (1–7). The total score ranged from 12 to 84, with higher scores indicating greater stress.

Table 1. Reliability testing, mean scores, and standard deviations of the 12-item stress scale (n = 267)

Item			
Item-total correlation	Cronbach's Alpha	Mean	SD
Feeling stressed due to working hours			
0.76	0.96	3.45	1.44
Risk of occupational injury			
0.72	0.96	3.07	1.47
Stress from patient-related injuries or illnesses			
0.80	0.96	3.29	1.58
Work interfering with social life			
0.82	0.96	3.42	1.46
Lack of time for family			
0.88	0.95	3.72	1.46
Lack of time to maintain good physical health			
0.89	0.95	3.66	1.41
Feeling fatigued due to work			
0.87	0.96	3.70	1.59
Health problems related to work			
0.85	0.96	3.85	1.57
Lack of understanding from family/friends about the job			
0.83	0.96	3.26	1.48
Difficulty making friends outside of work			
0.85	0.96	3.37	1.56

Item			
Item-total correlation	Cronbach's Alpha	Mean	SD
Restricted social life			
0.88	0.95	3.37	1.45
Feeling as if always at work			
0.87	0.95	3.64	1.55
Total			
	0.96	41.8	15.0

SD: Standard deviation

The internal consistency of the 12-item stress scale was assessed using Cronbach's Alpha. Results showed Alpha = 0.96, with item–total correlations ranging from 0.72 to 0.88. No item needed to be removed. The mean scores of individual items ranged from 3.07 to 3.85, with an overall mean total score of 41.8 (SD = 15.0)

Table 2. Classification of nurses' stress levels (n = 267)

Stress level	Frequency	Percentage (%)
None	6	2.3
Mild	100	37.4
Moderate	99	37.1
High	62	23.2

The proportions of nurses experiencing occupational stress at the levels of none, mild, moderate, and high were 2.3%, 37.4%, 37.1%, and 23.2%, respectively.

3.2. Factors associated with occupational stress among nurses

Table 3. Demographic characteristics and occupational stress among nurses

Demographic characteristics	Total	Moderate–High (n = 161)		None-Mild (n = 106)		OR (95% CI)	p
	n	n	%	n	%		
Sex							
Male	48	26	54.2	22	45.8	1	
Female	219	135	61.6	84	38.4	1.4 (0.7-2.6)	0.338
Age group							
< 30	40	22	55.0	18	45.0	1	
30 - 40	173	108	62.4	65	37.6	1.4 (0.7-2.7)	0.386
> 40	54	31	57.4	23	42.6	1.1 (0.5-2.5)	0.816
Marital status							
Married	222	134	60.4	88	39.6	1	
Single	45	27	60.0	18	40.0	0.9 (0.5-1.9)	0.964
Currently caring for young children							
No	70	35	50.0	35	50.0	1	
Yes	197	126	64.0	71	36.0	1.8 (1.1-3.1)	0.041
Single parent							
No	248	145	58.5	103	41.5	1	
Yes	19	16	84.2	3	15.8	3.8 (1.1-13.3)	0.038
Physical health status							
Grade 1	130	71	54.6	59	45.4	1	
Grade 2	106	64	60.4	42	39.6	1.2 (0.8-2.1)	0.374
Grade 3-4	31	36	83.9	5	16.1	4.3 (1.6-12.0)	0.005

n: frequency; %: Percentage; CI: Confidence Interval

In the analysis of demographic factors, sex, age group, and marital status showed no statistically significant differences in occupational stress. The proportion of moderate–high stress was 54.2% in males and 61.6% in females (OR = 1.4; 95% CI: 0.7–2.6; p = 0.338). Stress prevalence across age groups (<30, 30–40, >40 years) ranged from 55.0% to 62.4%, with no significant associations (p > 0.3). Marital status was not associated with stress levels (p = 0.964).

Nurses caring for young children had a higher prevalence of moderate–high stress compared to those without (64.0% vs. 50.0%; OR = 1.8; 95% CI: 1.1–3.1; p = 0.041). Regarding physical health, those classified as Grades 3–4 had a significantly higher prevalence of stress (83.9%) than Grades 1–2, with an increased risk (OR = 4.3; 95% CI: 1.6–12.0; p = 0.005). Being a single parent was also strongly associated with higher stress levels (84.2% vs. 58.5%; OR = 3.8; 95% CI: 1.1–13.3; p = 0.038)

Table 4. Occupational characteristics and occupational stress among nurses

Occupational characteristics	Total	Moderate–High (n = 161)		None-Mild (n = 106)		OR (95% CI)	p
	n	n	%	n	n		
Department							
Emergency/ICU	40	31	77.5	9	22.5	1	
Internal medicine	65	34	52.3	31	47.7	0.3 (0.1-0.8)	0.011
Surgery	45	28	62.2	17	37.8	0.5 (0.2-1.2)	0.130
Pediatrics	13	12	92.3	1	7.7	3.5 (0.4-30.5)	0.260
Administrative/ para-clinical	104	56	53.8	48	46.2	0.3 (0.1-.8)	0.010
Years of experience							
< 10 years	80	43	53.7	37	46.2	1	
≥ 10 years	187	118	63.1	69	36.9	1.1 (0.9-1.4)	0.263
Working hours/day							
≤ 8 hours	146	75	51.4	71	48.6	1	
> 8 hours	121	86	71.1	35	28.9	2.3 (1.4-3.9)	0.001
Employment status							
Contract/trial	16	8	50.0	8	50.0	1	
Permanent	251	153	61.0	98	39.0	1.6 (0.6-4.3)	0.388
Monthly income							
< 10 million VND	109	66	60.5	43	39.5	1	
10-15 million VND	54	33	61.1	21	38.9	1.0 (0.5-2.0)	0.945
> 15 million VND	87	54	62.1	33	37.9	1.1 (0.6-1.9)	0.828

n: frequency; %: Percentage; CI: Confidence Interval

Analysis of occupational characteristics showed significant differences in stress prevalence across departments. Nurses in emergency/ICU had a 3.1-fold higher risk of moderate–high stress compared to those in internal medicine (p = 0.011) and a 3.0-fold higher risk compared to administrative/para-clinical staff (p = 0.010). Nurses in pediatrics tended to report higher stress, but the difference was not statistically significant (OR = 3.5; p = 0.260).

Years of experience (≥ 10 vs. < 10 years) was not significantly associated with stress (p = 0.263). However, working > 8 hours/day significantly increased the risk of stress (OR = 2.3; 95% CI: 1.4–3.9; p = 0.001).

Employment status (contract/trial vs. permanent) and monthly income were not significantly associated with stress (p > 0.3 and p > 0.8, respectively). However, the prevalence of moderate–high stress remained high across all income groups.

4. DISCUSSION

4.1. Discussion

The reliability test of the scale showed a very high Cronbach's alpha coefficient (0.96), confirming excellent internal consistency. All items–total correlations exceeded 0.7, far above the conventional acceptance threshold (0.3–0.4), indicating that each item significantly contributed to the overall construct. This provides a solid foundation for applying the scale reliably in the Vietnamese context. The mean item scores ranged from 3.07 to 3.85 on a 5-point Likert scale, reflecting an overall moderate-to-high level of stress. The most prominent stressors included work-related health problems (3.85 ± 1.57), fatigue (3.70 ± 1.59), and lack of time for family (3.72 ± 1.46). These findings highlight that the primary sources of stress stem from the combination of physical workload and work–family conflict.

In terms of social stressors, items such as "lack of understanding from family/friends," "difficulty making friends outside work," and "limited social life" all scored above 3.3. Rotating shifts and prolonged working hours often make it difficult for nurses to maintain an everyday social life. In contrast, occupational risk factors such as "risk of injury" or "stress from patients" had slightly lower mean scores (≈3.1–3.3), suggesting that nurses may have adapted to physical hazards. In contrast, greater challenges arise from disruptions to social roles and mental well-being. A similar trend was reported by Ruotsalainen et al. [4].

The mean total stress score (41.8 ± 15.0) indicated a concerning level of stress, comparable to or even higher than those reported in studies conducted in Thailand and China. Stress classification revealed that the majority of nurses experienced mild-to-moderate stress (74.5%), while nearly one-fourth (23.2%) reported high stress. Notably, only 2.3% reported minimal or no stress, indicating that occupational stress is both prevalent and challenging to avoid in nursing.

When compared with local studies, these findings are consistent with Le Thi Thanh Xuan's research in Hanoi, which reported 47.83% [5] And with Shbre Tsegaw's study in Ethiopia, which found 48.4% [7]. According to the American Institute of Stress, nursing is recognized as a highly stressful profession due to complex job demands, high expectations, excessive responsibilities, and limited authority—factors identified as primary stressors [8].

4.2. Factors associated with occupational stress among nurses

The study revealed that moderate-to-high stress levels were relatively common among nurses. However, demographic factors such as sex, age, and marital status were not significantly associated with stress, which is consistent with both local and international studies. This suggests that the core pressures of the profession (workload, long shifts, exposure to critically ill or dying patients, and emotional demands) outweigh individual demographic differences.

In contrast, three socio-familial and physical health factors were significantly associated with stress. Nurses with young children were more likely to experience stress (OR = 1.8), consistent with previous studies highlighting the burden of work–family conflict and sleep deprivation. Poor physical health (categories 3–4) was strongly linked to stress, possibly due to the bidirectional cycle of fatigue, pain, and psychological strain—paralleling international findings on the relationship between musculoskeletal pain and burnout. Particularly, being a single parent was associated with nearly a fourfold higher risk of stress, aligning with sociological evidence that this group lacks adequate support and faces greater challenges in balancing work and family responsibilities [1]. This underscores the need for flexible scheduling and targeted psychological support for this vulnerable group.

From an occupational perspective, nurses in Emergency and Intensive Care Units faced the highest risk of stress due to the intense nature of their work, heavy workloads, and challenging environments. These units receive critically ill patients requiring rapid interventions and advanced resuscitation techniques, demanding sustained concentration and teamwork under pressure. Long working hours, frequent shifts, and patient overload exacerbate fatigue, while exposure to infectious diseases, workplace violence, and the emotional toll of patient outcomes further intensifies stress. These findings are consistent with Nguyen Thi Thuong (2023) [9] and Zhou Yinghao in China (2023) [10]. Both studies reported that ICU nurses experienced the highest levels of stress within hospitals. This highlights the need for workforce management policies to prioritize support for ICU and emergency nurses, who face compounded professional, physical, and emotional pressures. Moreover, working more than 8 hours per day significantly increased the risk of stress (OR = 2.3), consistent with prior research linking extended working hours to occupational burnout. Conversely, employment status (contract vs. permanent) and salary level were not significantly related to stress, suggesting that the primary drivers of stress among nurses are work conditions and professional demands rather than financial factors.

5. CONCLUSION

Occupational stress among nurses was notably high, with 37.1% experiencing moderate stress and 23.2% reporting high stress. The findings emphasize the urgent need for effective workload management within departments, limitations on working hours exceeding 8 per day, and additional support for nurses with young children, particularly single parents and those with poor physical health, to reduce stress and promote mental well-being.

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