Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v6i2.1580
*Biol. Clin. Sci. Res. J., Volume 6(2), **2025**: 1580*
Original Research Article

Low Back Pain and Work-Related Factors Among Nurses in Intensive Care Units

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(Received, 4th February 2025, Accepted 22nd February 2025, Published 28th February2025)

Abstract: *Low back pain (LBP) is a common occupational health concern among nurses, particularly those working in intensive care units (ICUs), due to the physical demands and shift patterns associated with patient care.* ***Objective:*** *To assess the prevalence and identify risk factors associated with low back pain among ICU nurses at a tertiary care hospital.* ***Methods:*** *A descriptive cross-sectional study was conducted from January 2024 to January 2025 at the Intensive Care Unit of Chaudhary Pervaiz Elahi Institute of Cardiology, Multan. A total of 100 ICU nurses directly involved in patient care were included. LBP prevalence was assessed based on self-reported pain frequency over the last 12 months using a four-point Likert scale: always, once weekly, once monthly, once bimonthly, or several months. Nurses also reported whether they had sought medical treatment for LBP. Odds ratios (OR) were calculated to determine the risk associated with clinical specialties, night shift frequency, and perception of staffing adequacy.* ***Results:*** ***88****% of ICU nurses reported experiencing low back pain in the past year. Pain was reported as occurring once a week by 40%, once a month by 28%, and always by 20% of participants. Only 20% of nurses had sought medical consultation for their symptoms. Nurses working in general surgical ICUs had a significantly elevated risk of LBP (OR: 1.71, 95% CI: 0.98–2.83, p=0.049), while those in cardiology and neurology ICUs were at the highest risk (OR: 3.01, 95% CI: 1.26–5.49, p=0.009). Additionally, working ≥6 night shifts per month increased LBP risk by 50%, and nurses perceiving inadequate staffing had a 65% higher risk of LBP.* ***Conclusion:*** *There is a high prevalence of low back pain among ICU nurses, with significant associations with clinical specialty, night shift frequency, and perceived staffing levels. Targeted interventions, including ergonomic training, workload redistribution, and optimized staffing, are needed to mitigate the burden of LBP in ICU settings.*

Keywords: Intensive Care Unit, ICU, Nurses, Nursing

[***How to Cite:*** Khan AY, Saif A. Low back pain and work-related factors among nurses in intensive care units. *Biol. Clin. Sci. Res. J.*, **2025;** 6(2): 118-121. doi: https://doi.org/10.54112/bcsrj.v6i2.1580

Introduction

The personal wellness of nurses is essential for maintaining quality of life and satisfaction, as well as providing the best care and safety for patients. Back pain is one of the health hazards in nurses, which is more prevalent than in other healthcare staff. According to labor statistics, nurses had the sixth-highest number of absentees due to back pain and musculoskeletal conditions (1). There is a 41-75% prevalence of back pain in Europe, 40-60% in Asia, and 47% in the US (2-4)

A follow-up of nursing students five years after their bachelor's reported back pain in 64% of Canadian nurses. The multi-center NEXT study of seven European countries showed that 46% reported neck and back pain as a hurdle in job performance and daily activities (5). The most affected nurses are ICU nurses, 14.2/100 have back injuries, significantly higher than pediatric nurses, with only 3.8/100 nurses having back pain.

ICU nurses predominantly suffer from back pain as they have to care for multiple critically ill patients, ensuring their ventilators, IVs, monitors, etc., are working correctly. Nurses are also responsible for lifting patients, changing their positions to avoid bed sores, and helping them with movement. They spend long durations in uncomfortable postures and bending, which increases the risk of back problems.

This study assessed the prevalence of low back pain and risk factors in ICU nurses at a tertiary care hospital.

Methodology

A descriptive cross-sectional study was conducted in the Intensive Care Unit of Chaudhary Pervaiz Ellahi Institute of Cardiology, Multan, from January 2024 to January 2025. A total of 100 ICU nurses involved in patient care and management were included in the study. Nurses who refused to participate were excluded. Every nurse provided consent to use their data for research. The hospital's ethical committee granted ethical approval to carry out the study.

Prevalence was recorded by asking the nurses about the frequency of low back pain and stiffness in the last 12 months, which could be answered on a four-point Likert scale, namely always, once weekly, once monthly, once bimonthly, or several months. According to Hales et al.'s definition of musculoskeletal disorders, the prevalence was considered back pain that occurred at least once a month. Nurses also asked if they had consulted a physician for treatment for the back pain.

Participant characteristics include age, sex social status, and employment characteristics including job title, ICU experience (less than 2 years, 2-4 years, and 5 years or more), and specialty (general medicine, general surgery, pediatrics, neonatology, cardiology, neurosurgery, neurology and thoracosurgery) and number of night shifts per months (0-5 nights or ≥6). The staffing adequacy of nursing staff was evaluated by asking the nurses if they think that the hired staff is enough for the workload and patient flow. It could be answered on a Likert scale from 1 to 4, with one being strongly agree and four being strongly disagree. The staff was considered adequate if nurses agreed or strongly agreed.

The prevalence of back pain and its treatment received by nurses was calculated by descriptive analysis based on their demographics and employment factors. Multiple logistic regression analysis was done to analyze the association between back pain and participant characteristics. Statistical significance was determined at p less than 0.05..

Results

By the definition of prevalence, 88% of nurses had back pain as they answered once a month. Forty nurses (40%) had back pain once a week, 28 (28%) had pain once a month, and 20 (20%) had pain always for the past 12 months. Only 20 (20%) seek treatment for the back pain. The mean age of nurses was 26.8 ± 3.7 years, with 95% of nurses being female. Most nurses (80%) were single, and 28% worked in general medicine. The average ICU experience was 3.6 years, with 40% of nurses having 2-4 years of experience. 20% of nurses considered the nursing staff adequate, and 75% of nurses attended six or more night shifts per month. The basic demographics and job details of nurses are shown in Table I.

Univariate analysis showed that single nurses (90%) were more likely to complain of back than married nurses (88% and 84%). However, married nurses with children (20%) were more likely to seek treatment for back pain than married nurses without children (17%). Nurses working in cardiology and neurology had the highest incidence (92%) and treatment ratio (24%) compared to other groups. Pediatric (86%) and neonatal (85%) nurses had the lowest pain prevalence. Nurses working ≥6 night shifts (90%) were more likely to have back pain than nurses working fewer shifts (85%). The prevalence and treatment of back pain were not associated with ICU experience. However, nurses with 2-4 years' experience (93%) had the highest pain prevalence.

Multiple regression analysis of factors illustrated in Table II suggested that nurses working in all specialties except pediatrics had a significantly higher risk of developing back pain than neonatal nurses. Among these specialties, nurses in the general surgical ICU were at significant risk (OR: 1.71) (95% CI: 0.98-2.83, p=0.049) and those in cardiology and neurology were at most risk (OR: 3.01) (95% CI: 1.26-5.49, p=0.009). Nurses in cardiology and neurology were also associated with a 65% higher likelihood of seeking treatment for pain than neonatal nurses. Nurses working ≥6-night shifts had 50% more risk, and nurses with inadequate perception of staffing were at 65% more risk of developing back pain. Marital status and job position had no association with back pain or treatment. ICU experience had a significant but non-linear association with back pain (p=0.039) and treatment (p=0.010).

Table I: Demographic and Employment Factors

Factors	N (%)
Mean age	26.8 ± 3.7
Female gender	95 (95%)
Social status	
Single	80 (80%)
Married without children	5 (5%)
Married with children	15 (15%)
ICU specialty	
General medicine	28 (28%)
General surgery	25 (25%)
Cardiology and neurology	6 (6%)
Neurosurgery and thoracosugery	10 (10%)
Pediatrics	6 (6%)
Neonatology	10 (10%)
Mixed	15 (15%)
Staff nurses	93 (93%)
ICU experience	
Less than 2 years	35 (35%)
2-4 years	40 (40%)
5 years or more	25 (25%)
Perceived adequate nurse staffing	20 (20%)
Night shifts per month	
0-5	25 (25%)
6 or more	75 (75%)
Back pain prevalence	
Always	20 (20%)
Once weekly	40 (40%)
Once monthly	28 (28%)
Once bimonthly or several months	12 (12%)
Back pain treatment	20 (20%)

Table 2: Association of Back Prevalence and Treatment Received with Patient Characteristics

	Back pain prevalence		Medical treatment received for back pain	
	OR (95% CI)	P	OR (95% CI)	P
Social status				
Single	Reference			
Married without children	1.1 (0.47-1.78)	0.912	0.78 (0.46-1.32)	0.364
Married with children	0.77 (0.56-1.21)	0.263	0.99 (0.58-1.53)	0.987
ICU specialty				
Mixed	1.79 (1.09-2.86)	0.022	1.34 (0.79-2.51)	0.250
General medicine	1.76 (0.99-3.23)	0.050	1.36 (0.73-2.62)	0.235

Cardiology and neurology	3.01 (1.26-5.49)	0.009	1.70 (1.13-2.60)	0.031
General surgery	1.71 (0.98-2.83)	0.049	1.43 (0.89-2.10)	0.126
Neurosurgery and thoracosugery	1.77 (1.24-2.75)	0.008	0.88 (0.56-1.93)	0.864
Pediatrics	1.42 (0.47-3.67)	0.405	0.97 (0.58-2.26)	0.961
Neonatology	Reference			
Job position				
Staff Nurse	1.35 (0.82-2.32)	0.153	1.18 (0.52-2.25)	0.562
Chief nurse	Reference			
ICU experience				
Less than 2 years	0.80 (0.56-1.34)	0.286	0.61 (0.45-0.73)	0.004
2-4 years	Reference			
5 years or more	0.57 (0.58-0.93)	0.006	0.90 (0.62-1.27)	0.517
Staffing				
Adequate	Reference			
Inadequate	1.55 (1.23-2.45)	0.008	0.97 (0.68-1.42)	0.982
Night shifts per month				
0-5	Reference			
6 or more	1.51 (1.06-2.02)	0.023	0.97 (0.69-1.50)	0.976

Discussion

This study was conducted to determine the prevalence and risk factors of low back pain in ICU nurses. The results revealed that there was an 88% prevalence of back pain in ICU nurses, which was significantly higher than reported by nurses in Africa (75%), China (63%), and Canada (56%) (6-8). Although the mean age was 26.8 years, the nurses were at higher risk of developing back pain than older nurses in developed countries (9). Nurses working in all specialties except pediatrics had a significantly higher risk of developing back pain than neonatal nurses.Those in cardiology and neurology were at the highest risk of back pain (OR: 3.01 (95% CI: 1.26-5.49, p=0.009) and were also associated with 65% more likelihood of seeking treatment for pain than neonatal nurses. Other studies have also reported the highest prevalence of back pain in cardiovascular ICU nurses (10).

Nurses with an inadequate perception of staffing were at 65% more risk of developing back pain than those who considered the staffing adequate. The National Academy of Medicine reported that among the work-related injuries, back injuries are associated with staffing (11). A USA study also concluded that back injuries and musculoskeletal disorders were less common in nurses working in a positive, employee-friendly environment (12).

Frequency of night shifts and back pain were significantly associated; nurses working ≥ 6 nights had 50% more risk than those working five or fewer shifts. This may be because working at night compromises sleep and cognitive abilities, which can lead to muscle straining. Similarly, a previous study showed that rotating nurses were more fatigued and night nurses had a 3 times higher chance of injury than daytime nurses (2). However, another study contradicts this and concluded that daytime nurses are more susceptible to back pain due to increased physical demands and patient load than other hours (13).

ICU experience had a significant but non-linear association with back pain, with nurses with 2-4 years' experience having a higher prevalence than nurses with more than 5 years' experience. Literature shows that new hires had a higher likelihood of back pain than highly experienced nurses, which can be due to a lack of experience in patient handling (14). It can also be because most experienced nurses change specialties and join a less demanding department.

Our study has some limitations. The cross-sectional study design limited the assessment of all variables. Secondly, the nurses included in the study only belonged to Punjab,, preventing the generalizability of the results. Extensive, longitudinal studies are needed to produce better results.

Conclusion

There is a high prevalence of low back pain in ICU nurses, which is associated with experience, specialties, and frequency of night shifts.

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-NNCCS-037-24)
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

AYK (Nursing Officer**)**
Manuscript drafting, Study Design,
Review of Literature, Data entry, Data analysis, and article drafting.
AS (Charge Nurse**)**
Conception of Study, Development of Research Methodology Design, Study Design, manuscript review, and critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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