Original Article

Correlation of Numeric Pain Rating Scale and Oswestry Disability Index of Non-Specific Low Back Pain among Nursing Staff

Abdul Ghaffar[1]*, Muhammad Mahmood Alam[1], Waseem Akhtar[1], Ishrat Fatima[1], Muhammad Burhan[1], Muhammad Mustafa Gul[1]

[1]Akhtar Saeed College of Rehabilitation Sciences Lahore
*Corresponding Author: Abdul Ghaffar, Physical Therapist; Email: ghaffar5886060@gmail.com
Conflict of Interest: None.

ABSTRACT

Background: In Pakistan, nurses are pivotal in healthcare, often facing musculoskeletal discomfort, with low back pain being particularly prevalent. Given their vital role in patient care, understanding the extent of this issue is crucial for improving their work conditions and health outcomes.

Objective: This study aims to evaluate the prevalence and impact of low back pain among nurses in Pakistani healthcare facilities, particularly focusing on those working in gynecology and obstetrics wards.

Methods: A cross-sectional study was conducted over six months, involving 150 nurses from gynecology and obstetrics wards across four major hospitals in Lahore. The Oswestry Low Back Disability Questionnaire and the Numerical Pain Rating Scale were employed for data collection. Analysis was performed using IBM SPSS Statistics 23, with a significance level set at 0.05.

Results: The study found that 58.7% of the nurses experienced low back pain, while 41.3% did not. A strong correlation (0.887) was observed between the Numeric Pain Rating Scale and Oswestry Disability Index, with a highly significant p-value of 0.000, indicating statistical significance at the 0.01 level.

Conclusion: The study concludes that nurses working morning shifts in gynecology and obstetrics wards are more likely to report higher average pain scores. Additionally, the strong correlation between the Numeric Pain Rating Scale and Oswestry Disability Index underscores the relationship between pain intensity and disability in this group.

Keywords: Gynecology, Low back pain, Musculoskeletal pain, Nurses, Obstetrics, Pain intensity, Pain measurement.

INTRODUCTION

Low back pain (LBP), a globally prevalent disorder, stands as the foremost cause of intense pain and disability, surpassing all other medical conditions in this regard (1). Characterized by discomfort in the posterior back area, stretching from below the costal margin to above the gluteal curve, LBP often extends towards the legs (2). Notably, even mild cases of LBP can precipitate significant functional impairment, markedly diminishing an individual's quality of life (3). Beyond personal suffering, LBP exerts substantial impacts on broader societal and economic spheres, manifesting in reduced labour force participation, decreased workplace productivity, and considerable financial burdens (4). Within the healthcare sector, nursing professionals are particularly susceptible to back injuries, a vulnerability attributed to the physical demands of their vocation (5).

Nurses, pivotal in the healthcare system, engage extensively with patients, often more so than other medical practitioners. This involvement entails continuous and direct patient care, a role central to the protection, development, and enhancement of patient well-being (6). The etiology of LBP in nurses is multifaceted, encompassing both individual and occupational risk factors. Statistics reveal that LBP is a common affliction, with 50 to 85 percent of the global population experiencing it at some point in their lives. Interestingly, the incidence of LBP among nurses is lower compared to other health professions (7).

The nursing profession, characterized by tasks such as patient lifting and varied postural requirements, categorizes nurses as a high-risk group for LBP (8). Their unique work schedules, encompassing day and night shifts, disrupt natural circadian rhythms, potentially leading to issues like poor sleep quality, fatigue, reduced work productivity, and a diminished awareness of safety concerns (9). LBP in individuals, including nurses, is not solely a physical ailment; it significantly disrupts emotional, social, and physical health,

impacting career prospects. Physical consequences include a decline in overall health and physical function, while the social impact is evident in reduced social activities. Psychosocial effects manifest as depression, insomnia, and anxiety (10). Consequently, nurses with LBP may face the need to leave their positions or adjust their work environments (11). Similarly, obstetricians and gynecologists, who often adopt poor postures during clinical practice, are also at risk. Prolonged bending, twisting of the trunk, and static postures during abdominal and pelvic examinations or gynecological surgeries exacerbate this issue (12).

A correlation exists between the adoption of proper body mechanics and the prevalence of LBP in nurses. Particularly in long-term care facilities, nurses are tasked with assisting patients who cannot perform daily activities independently. Studies have identified patient transfer and lifting as primary contributors to back discomfort among nursing staff (13). The prevalence of work-related musculoskeletal disorders in nursing personnel is noteworthy. These disorders incur indirect costs, such as hiring temporary staff, covering overtime, legal expenses, processing claim time, decreased productivity following traumatic events, and training new staff, all contributing to heightened stress and depression (14).

Preventive strategies for these back injuries focus on patient education and training in biomechanics related to lifting procedures. Implementing ergonomic principles methodically in line with work demands has been emphasized in various studies. Nursing aides in nursing homes identified patient transfer from a seated toilet to a wheelchair as particularly stressful, while using a walking belt for patient transfers emerged as the least stressful and most convenient method (15).

This research stemmed from the observed high incidence of back pain among colleagues in clinical settings. Its primary objective is to ascertain the prevalence of back pain among nurses associated with obstetricians or gynecologists, an area hitherto unexplored. The study aims to provide insights into the correlation between LBP and occupational risks in nursing, particularly in specialties like obstetrics and gynecology. By highlighting the multifaceted nature of LBP in the nursing profession, this research seeks to contribute to a more comprehensive understanding of the condition and its implications for healthcare professionals.

MATERIALS AND METHODS

The study, conducted in Lahore, was a collaborative effort involving four hospitals: Akhtar Saeed Trust Teaching Hospital, Farooq Hospital, University of Lahore Teaching Hospital, and Bahria International Hospital. Spanning six months from July to December 2022, it adhered to a cross-sectional design, sanctioned by the Institutional Review Board (IRB) of Akhtar Saeed College of Rehabilitation Sciences, Lahore. The research aimed to explore the correlation between the Numeric Pain Rating Scale and Oswestry Disability Index in assessing non-specific low back pain among nursing staff.

To establish a representative sample, 150 participants were selected using the EPI software. The selection process employed a non-probability convenience sampling method, deemed practical for data collection within the constraints of the study's resources and timeframe. Participants, comprising registered nurses aged between 25 and 40 years, were specifically sourced from gynecological wards. These individuals possessed a minimum of six months' experience, a criterion ensuring the relevance and depth of the data collected.

The inclusion criteria were meticulously set to encompass registered nurses within the defined age range, possessing pertinent professional experience, and devoid of emotional disorders or severe chronic diseases. This approach was crucial to maintain the integrity of the study, ensuring that the data reflected the experiences of a specific demographic, free from confounding variables related to emotional or chronic health conditions.

Conversely, the exclusion criteria were equally stringent, disqualifying individuals with specific pathologies, outside the age range of 25 to 40, those with a history of spinal surgery or deformities, degenerative diseases, and obesity. These exclusions were imperative to eliminate potential biases and ensure that the study's focus remained on non-specific low back pain rather than conditions that could independently influence pain or disability levels.

Data collection was executed through convenience sampling. Each respondent provided physical responses and was briefed on the research's advantages and potential drawbacks through consent forms. The primary instruments utilized were the Oswestry Low Back Disability Questionnaire and the Numerical Pain Rating Scale. These tools were selected for their efficacy in quantifying pain levels and the degree of disability caused by low back issues in the respondents' daily lives. Subsequent data analysis was conducted using SPSS version 23.0, employing frequency distribution and graphical representations for a comprehensive interpretation of the results.

RESULTS

The study's findings revealed a notable prevalence of low back pain among nurses, particularly within the age group of 25-32 years, where it constituted 11.5% of the participant cohort. Interestingly, the research indicated that the duration of working hours and the amount of time spent standing had a minimal impact on the frequency and intensity of low back pain among the nurses.

A significant variation in the prevalence of low back pain was observed across different shift timings. Nurses working in the morning shift reported a higher incidence of low back pain, at 62.7%. In contrast, those on evening and night shifts experienced lower rates, at 33.3% and 4.0%, respectively. This variation underscores the potential influence of shift timing on the occurrence of low back pain. The majority of nurses, accounting for 62.0%, worked 6-hour shifts, while the remaining 37.3% were engaged in longer, 12-hour shifts. Typically, nurses stood for about 5 hours during their shifts, although a significant portion (37.3%) reported standing for as long as 11 hours.

Furthermore, the study uncovered a strong positive correlation between the scores of the Numeric Pain Rating Scale and the Oswestry Disability Index. This correlation was statistically significant, with a p-value of 0.000, indicating a high level of significance at the 0.01 level (2-tailed). This finding underscores the relationship between the intensity of pain experienced and the extent of disability it causes, with the threshold for statistical significance set at a p-value of 0.05 or lower.

Table 1 Duration of Work Shift

Duration	Frequency	Percentage	Valid Percentage
6 hours	93	62.0	62.0
8 hours	1	.7	.7
12 hours	56	37.3	37.3
Total	150	100.0	100.0

Table 1.1 in the study presents data on the duration of work shifts among the participants. It categorizes the shifts into three durations: 6 hours, 8 hours, and 12 hours. The table shows that the majority of participants, 93 individuals or 62.0%, worked 6-hour shifts. A very small number, only 1 participant or 0.7%, reported working 8-hour shifts. The remaining 37.3% of the participants, totaling 56 individuals, were engaged in longer 12-hour shifts. The table confirms that these frequencies and percentages are valid with a cumulative total of 150 participants, accounting for 100.0% of the sample size. This distribution provides insights into the typical work shift lengths for nurses in the study.

Table 2 Duration of Standing during Shift

Duration of Standing During Shift		Frequency	Percentage	Valid Percentage	Cumulative Percentage
	5	92	61.3	61.3	61.3
	5	1	.7	.7	62.0
	7	1	.7	.7	62.7
	11	56	37.3	37.3	100.0
	Total	150	100.0	100.0	

Table 1.2 of the study details the duration of standing during work shifts among nursing staff. It reveals that a majority, 61.3% or 92 participants, stood for 5 hours during their shifts. Interestingly, an additional 0.7%, making the total 62.0%, also reported standing for the same duration. Only one nurse, representing 0.7% of the sample, stood for 7 hours, slightly increasing the cumulative percentage to 62.7%. In contrast, a significant number, 37.3% or 56 participants, reported standing for as long as 11 hours. The total sample size was 150 participants, encompassing 100.0% of those surveyed. This data underscores the variations in standing duration during shifts among the nurses.

Table 3 Prevalence of Low Back Pain

Low back Pain	Frequency	Percentage	Valid Percentage
YES	88	58.7	58.7
NO	62	41.3	41.3
Total	150	100.0	100.0

Table 1.3 in the study focuses on the prevalence of low back pain among the participants. It shows that out of the total sample of 150 participants, 58.7%, which corresponds to 88 individuals, reported experiencing low back pain. Conversely, 41.3% of the

participants, amounting to 62 individuals, did not report such pain. These figures confirm that more than half of the surveyed nursing staff experienced low back pain, underlining its prevalence in this professional group. The total number of participants adds up to 100.0%, ensuring the completeness of the data set.

Table 4 Duration of Low Back Pain

Duration of Pain	Frequency	Percentage	Valid Percentage
NO PAIN	62	41.3	41.3
Less than 5 mins	3	2.0	2.0
10-15mins	10	6.7	6.7
15-20mins	7	4.7	4.7
30 mins or more	68	45.3	45.3
Total	150	100.0	100.0

Table 1.4 in the study delineates the duration of low back pain experienced by the participants. It categorizes the pain duration into various timeframes, revealing a diverse range of experiences among the 150 participants. The table shows that 41.3% of the participants, equating to 62 individuals, did not experience any pain. A small percentage, 2.0% or 3 participants, reported pain lasting less than 5 minutes. Slightly higher, 6.7% or 10 participants experienced pain for 10-15 minutes, and 4.7% or 7 participants had pain lasting 15-20 minutes. Notably, the largest group, comprising 45.3% or 68 participants, experienced pain for 30 minutes or more. This distribution highlights the variability in pain duration among nurses, with a significant portion experiencing prolonged periods of low back pain. The data culminates in a total of 100.0%, ensuring a comprehensive representation of the sample.

Table 5 Correlation between the Scores of Numeric Pain Rating Scale and Oswestry Disability Index

Total Disability and Numeric Pain Rating Scale	Pearson Correlation	P- Value
	.887**	0.000
**. Correlation is significant at the 0.01 level (2-tailed).		

Table 1.5 in the study presents the correlation between the scores of the Numeric Pain Rating Scale and the Oswestry Disability Index, key measures used to assess the severity and impact of low back pain. The table indicates a strong positive correlation, with a Pearson Correlation coefficient of .887. This high correlation coefficient suggests a significant and direct relationship between the intensity of pain experienced (as measured by the Numeric Pain Rating Scale) and the level of disability (as assessed by the Oswestry Disability Index). Furthermore, the p-value associated with this correlation is 0.000, denoting a high level of statistical significance at the 0.01 level (2-tailed). This statistical significance underscores the robustness of the relationship between pain intensity and disability level among the study participants.
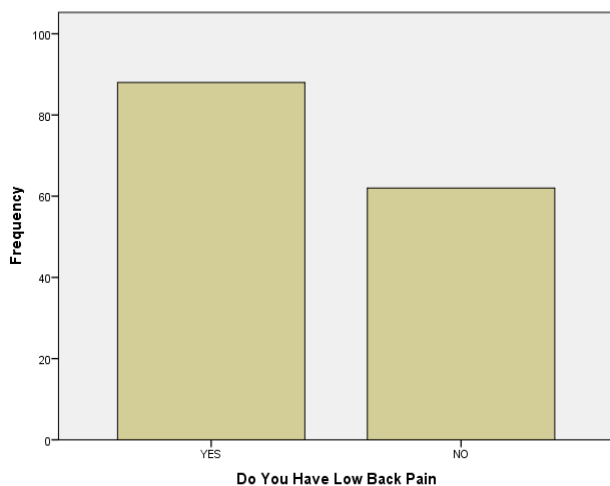

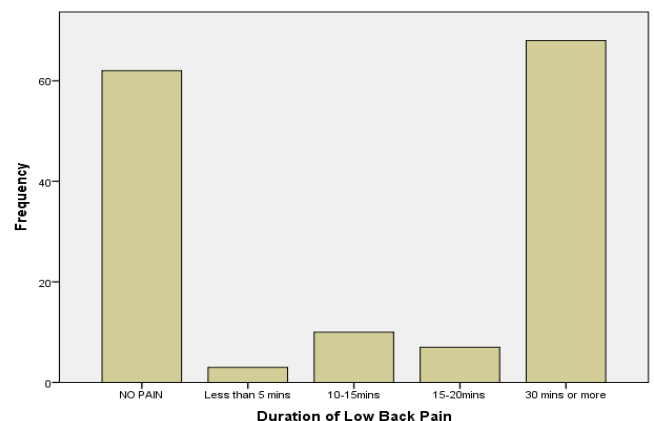Figure 2 Prevalence of Low Back Pain

Figure 1 Duration of Low Back Pain

DISCUSSION

Studies on low back pain in nurses revealed that, in contrast to other musculoskeletal system issues, low back pain was more common in nurses (16). The results of earlier research were found to be consistent with our observation that the majority of the nurses in our study had low back discomfort. As a result, it's critical to identify the risk factors and implement the appropriate preventative measures for low back pain in nurses. As vital contributors to the preservation, enhancement, and protection of people's health, nurses should prioritize taking preventative and corrective measures for their own well-being in order to maintain high standards of nursing care, maximize productivity, and deliver uninterrupted patient care (17).

The majority of the nurses in our study conducted interventions that required them to bend forward, lift and reposition patients, and work for extended periods of time standing up. These nurses also reported higher average low back pain ratings. Furthermore, it was noted that the majority of nurses believed in the benefits of employing helping equipment, such as posture correctors and lumber support belts, but did not use it during interventions. The startling finding is that, despite the knowing that nurses routinely carried out procedures that would increase the risk of low back pain and that they were aware of how to use support belts appropriately, they failed to apply this knowledge in their interventions. The lack of knowledge provided to nurses on the potential causes of low back pain and the insufficient time allotted during interventions for correct posture and the use of supportive belts, among other things, could account for this outcome.

Gender and low back pain were found to be related in a prior study, with women being more likely to report low back pain. This finding might be explained by the structural, physiologic, and anatomical differences between the sexes as well as the small percentage of male nurses in our sample. Additionally, our research showed a statistically significant correlation between female gender and low back pain. However, in a different study done in a different nation, there was no discernible link between Greek and Dutch nurses' low back pain and their gender (18).

Workplace factors like hours worked and type of job were found to have no effect on low back pain in our investigation. It has been noted that low back pain grew somewhat in tandem with longer workdays, and that this outcome was linked to taking less breaks (19). A different study evaluated the connection between low back pain and the workplace clinic. It was noted that the high workloads in the ICU and orthopaedic departments are likely to result in low back pain. As a result, it was recommended that the risk assessments of the nurse-staffed clinics be conducted (20). The average low back pain score was greater among the nurses in our study, particularly those who worked in gynecological wards. Similarly, other researchers also found that nurses working in these clinics had a higher prevalence of low back pain (21). The fact that nurses working in pediatric and internal medicine units administer interventions more frequently to patients who require specialized nursing care—i.e., patients who are more likely to experience low back pain—may be the reason why these nurses' average low back pain scores are higher.

According to these findings, it is recommended that nurses participate in ongoing education programs to reduce risk factors that could lead to low back pain; that they receive instruction on how to use assistive technology, such as posture correctors and lumber support belts, which would lessen physical strain; and that the appropriate procedures be set up to closely monitor adherence to these guidelines. Furthermore, it is seen to be crucial to pay close attention to proper body mechanics during all nurse interventions related to patient care, and to take into account the variations in low back pain risk factors amongst clinics.

CONCLUSION

The study concluded that among nurses working in gynecology and obstetrics wards, the duration of standing or length of work shifts did not significantly affect average pain scores. However, a significant and strong correlation was found between the scores of the Numeric Pain Rating Scale and the Oswestry Disability Index. This correlation highlights the relationship between the intensity of pain experienced and the resulting impact on disability among these nursing professionals.

REFERENCES

1. Kamper SJ, Apeldoorn AT, Chiarotto A, Smeets RJ, Ostelo RW, Guzman J, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis. Bmj. 2015;350.
2. Altinel L, Kose KC, Ergan V, Isik C, Aksoy Y, Ozdemir A, et al. The prevalence of low back pain and risk factors among adult population in Afyon region, Turkey. Acta Orthop Traumatol Turc. 2008;42(5):328-33.
3. Dlungwane TP. Prevalence of low back pain amongst nurses at Edendele hospital 2010.
4. Monteiro MS, Alexandre NMC, Ilmarinen J, Rodrigues CM. Work ability and musculoskeletal disorders among workers from a public health institution. International Journal of Occupational Safety and Ergonomics. 2009;15(3):319--24.

5. El-Soud AMA, El-Najjar AR, El-Fattah NA, Hassan AA. Prevalence of low back pain in working nurses in Zagazig University Hospitals: an epidemiological study. Egyptian Rheumatology and Rehabilitation. 2014;41:109-15.

6. Akinci A, Dereli E, Sert H. Low back paın among nurses workıng in Kırklareli and the associated factors. Journal of the Acıbadem University of Health Sciences. 2014;1:70-6.

7. Mehrdad R, Shams-Hosseini NS, Aghdaei S, Yousefian M. Prevalence of low back pain in health care workers and comparison with other occupational categories in Iran: a systematic review. Iranian journal of medical sciences. 2016;41(6):467.

8. Omokhodion F, Umar U, Ogunnowo B. Prevalence of low back pain among staff in a rural hospital in Nigeria. Occupational Medicine. 2000;50(2):107-10.

9. Trinkoff AM, Storr CL, Lipscomb JA. Physically demanding work and inadequate sleep, pain medication use, and absenteeism in registered nurses. Journal of Occupational and Environmental Medicine. 2001:355-63.

10. Eriksen W, Bruusgaard D, Knardahl S. Work factors as predictors of intense or disabling low back pain; a prospective study of nurses' aides. Occupational and environmental medicine. 2004;61(5):398-404.

11. Moussa MMM, El-Ezaby HH, El-Mowafy RI. Low back pain and coping strategies' among nurses in Port Said City, Egypt. Journal of Nursing Education and Practice. 2015;5(7):55-62.

12. Dolan L, Martin D. Backache in gynaecologists. Occupational Medicine. 2001;51(7):433-8.

13. Karahan A, Bayraktar N. Determination of the usage of body mechanics in clinical settings and the occurrence of low back pain in nurses. International Journal of Nursing Studies. 2004;41(1):67-75.

14. Dlungwane T, Voce A, Knight S. Prevalence and factors associated with low back pain among nurses at a regional hospital in KwaZulu-Natal, South Africa. Health SA Gesondheid. 2018;23.

15. Owen BD, Garg A. Reducing risk for back pain in nursing personnel. AAOHN journal. 1991;39(1):24-33.

16. Mehrdad R, Dennerlein JT, Haghighat M, Aminian O. Association between psychosocial factors and musculoskeletal symptoms among Iranian nurses. American journal of industrial medicine. 2010;53(10):1032-9.

17. Yılmaz E, Özkan S. Determination of the Prevalence of Low Back Pain Among Nurses Working in Hospitals/ Hastanede Çalışan Hemşirelerde Bel Ağrısı Prevalansının Saptanması. 2008;54.

18. Alexopoulos EC, Burdorf A, Kalokerinou A. A comparative analysis on musculoskeletal disorders between Greek and Dutch nursing personnel. International archives of occupational and environmental health. 2006;79:82-8.

19. Trinkoff AM, Le R, Geiger-Brown J, Lipscomb J, Lang G. Longitudinal relationship of work hours, mandatory overtime, and on-call to musculoskeletal problems in nurses. American journal of industrial medicine. 2006;49(11):964-71.

20. Vieira ER, Kumar S, Coury HJ, Narayan Y. Low back problems and possible improvements in nursing jobs. Journal of advanced nursing. 2006;55(1):79-89.

21. June KJ, Cho SH. Low back pain and work-related factors among nurses in intensive care units. Journal of clinical nursing. 2011;20(3-4):479-87.