Prevalence, Severity, and Determinants of Low Back Pain Among Nurses at Sohar Hospital, Oman: A Cross-sectional Study

Malik Saif Al Jabri[1]*, Eman Elsayed Abd-Ellatif[2], Abdulaziz Saad AlMutairi[3], Hamed Khamis Al Reesi[4], Sami Mohammed Al Mujaini[5], Ahmed Obaid Al Mashaykhi[5], Zalikha Khamis Al-Marzouqi[6] and Aida Saeed Al Dhoani[7]

[1]Ministry of Health, Muscat, Oman

[2]Ministry of Health, Saudi Arabia

[3]Ministry of Health, Saudi Arabia

[4]Epidemiology and Public Health, Ministry of Health, Oman

[5]DFE, Ministry of Health, Muscat, Oman

[6]PhD in Nursing, Ministry of Health, Muscat, Oman

[7]DHSM, Ministry of Health, Muscat, Oman

Received: 27 July 2025

Accepted: 22December 2025

*Corresponding author: hala1485@hotmail.com

DOI 10.5001/omj.2025.112

Abstract

Objectives: Low back pain (LBP) is a common occupational issue among healthcare professionals, yet data from Oman are limited. This study aimed to assess the prevalence, severity, consequences, and determinants of LBP among nurses at Sohar Hospital, Oman.

Methods: A cross-sectional study was conducted from all departments of Sohar Hospital in September 2024, involving 385 nurses recruited through convenience sampling. Participants completed a structured electronic questionnaire covering sociodemographic, characteristic, medical history, work-related factors, and LBP prevalence, using the Nordic Musculoskeletal Questionnaire. Pain severity was measured using a numeric rating scale. Data were analyzed using SPSS, Version 26; binary logistic regression analysis identified predictors of LBP, with significance set at a P <0.05.

Results: Of the 385 nurses surveyed (response rate: 100%), 82.34% (n = 317; 95% confidence interval [CI]: 78.5–86.1) reported experiencing LBP. Among them, 91 nurses (28.71%) reported severe pain, and in 7 cases (2.21%), the pain was described as the worst. A total of 108 (34.07%) required medical consultation, and in 149 (47.00%), the pain prevented them from performing their work. Binary logistic regression analysis identified female gender (AOR = 3.97; 95% CI: 1.06–14.88; p = 0.041), Omani citizen (AOR for non-Omani citizen = 0.15; 95% CI: 0.06–0.39; p < 0.001), history of surgical procedures (AOR = 3.15; 95% CI: 1.52–6.53; p = 0.002), perceived inadequate staffing (AOR = 2.32; 95% CI: 1.16–4.62; p = 0.017), and assignment in the female internal medicine ward (AOR = 11.02; 95% CI: 1.57–77.38; p = 0.016) as factors significantly associated with LBP.

Conclusion: LBP is highly prevalent among nurses at Sohar Hospital and is significantly associated with both personal and occupational factors, including gender, nationality, surgical history, ward assignment, and perceived staffing inadequacy. Targeted interventions, including workplace ergonomic modifications, adequate staffing policies, and preventive occupational health programs, are warranted to mitigate the burden of LBP and enhance nurses' well-being and performance.

Keywords: Oman; Low Back Pain; Nursing Staff; Prevalence; Severity.

Introduction

Pain is an unpleasant sensation caused by disease or injury, serving as a protective mechanism to signal harm.[1] "Lumbago, lumbosacral pain is a kind of back pain that occurs below the 12th rib and above the gluteal folds".[1,2] Globally, low back pain (LBP) is among the most common medical complaints, representing one of the most prevalent musculoskeletal disorders and a major occupational health issue.[3] LBP can become chronic, contributing significantly to global work productivity loss[4] and disability.[5] It is estimated that 70–85% of people worldwide experience LBP during their lifetime [6,7] Its impact on daily activities and quality of life is substantial, and the economic burden of its treatment continues to rise globally.[8] Between 1990 and 2015, the global burden of LBP, measured in disability-adjusted life years (DALYs), increased by 54%, particularly affecting low- and middle-income countries in the Middle East, Africa, and Asia, where healthcare resources are limited.[9]

Musculoskeletal disorders are prevalent, affecting 5.7% of those who work in industrial areas and 8.8% of hospital workers among healthcare professionals.[10] Nurses, in particular, who play a significant role in the medical community frequently experience low back pain (LBP), which leads to work limitations and absenteeism, and are the sixth most likely profession to miss workdays due to low back pain.[2,10,11] International studies report LBP prevalence rates among nurses of 62% in Italy,[12] 63.6% in Africa,[13] 80% in Saudi Arabia,[14] and 54.3% in Qatar.[15] Key contributing factors include sociodemographic characteristics (e.g., gender, age, nationality, weight, experience),[16,17] as well as occupational factors such as long working hours, shift work, overtime, hospital environments, manual lifting, and job stress.[18–20]

In Oman, low back pain (LBP) among nurses is recognized as a national research priority. The few studies conducted in Oman have found that LBP is common among nurses and is associated with disability; however, research on this topic remains scarce.[5,21] Existing local findings cannot be directly generalized due to evolving hospital workflows, technologies, and staffing models. Therefore, updated data are essential to inform context-specific interventions.

The aim of this study is to assess the prevalence, severity, and associated risk factors of low back pain (LBP) among nurses at Sohar Hospital, North Al Batinah Governorate, Oman, and to evaluate its occupational and functional consequences in order to inform evidence-based strategies for prevention and management.

The main objectives of this study are: 1.To determine the 12‑month and 7‑day prevalence of low back pain (LBP) among nurses at Sohar Hospital in 2024. 2. To assess the severity and duration of LBP episodes among nurses at Sohar Hospital in 2024. 3. To identify sociodemographic, occupational, and clinical factors associated with LBP prevalence 4.To evaluate the impact of LBP on work performance and healthcare-seeking behavior among nurses, including functional impairment and medical consultation rates.

Methods

This cross-sectional survey was conducted at Sohar Hospital, North AL Batinah Governorate, Oman, in September 2024. Sohar Hospital is a 408-bed tertiary teaching and referral centre and the only regional hospital in the governorate. The target population consisted of all nurses employed at Sohar Hospital—approximately 1,279 across all departments in 2024 (based on data from the Department of Information and Statistics at Sohar Hospital).

Inclusions criteria included all full-time registered nurses working at Sohar Hospital during the study period, of any gender and nationality, who were actively engaged in direct patient care, had a minimum of three months of professional experience, and represented all hospital departments and work shifts.

Exclusion criteria included nurses who were pregnant, on extended leave exceeding three months, diagnosed with prolapsed intervertebral disc disorders or other known musculoskeletal disorders, had less than three months of work experience, or were nursing interns, students, or nurses who declined to participate.

Sample size was calculated using the single population proportion equation: ($N = \frac{Z^2 p(1-p)}{d^2}$) , assuming a 95% confidence interval (CI) level (Z= 1.96), an expected LBP prevalence of 65% (P = 0.65, based on a prior

Omani study, and a 5% margin of error (d = 0.05). The minimum required sample was 346, increased to 380 to account for an anticipated 10% non-response rate. Eligible nurses were invited to complete the electronic survey.

Data were collected using a structured, self-administered questionnaire adapted from the standardized Nordic Musculoskeletal Questionnaire (NMQ)[22], with additional items on sociodemographic variables including age, gender, nationality group, education level, and marital status; health-related variables including BMI classification, given the range of BMI in each classification, comorbidities such as diabetes mellitus, hypertension, etc., and any history of surgical procedures; work-related variables including working ward, assignment to a fixed morning shift or rotating shifts, work experience, and involvement in manual lifting. Given previous evidence linking staff shortages to LBP among nurses,[23] perceived staffing inadequacy was also assessed. Relying on nurses' perception of staffing shortages was the most suitable approach, as nurse distribution is not always based on patient numbers or care needs, which can lead to potential imbalances. Since nurses are directly involved in care delivery, they are best positioned to assess workload demands. Their perception provides valuable insight, especially when examining its association with outcomes like lower back pain.

The English version of the NMQ-E demonstrated high test-retest reliability, with kappa values (κ/κmax) ranging from 0.71 to 0.96 for self-administration and from 0.76 to 1.00 for self-versus-interview administration[24].It was used to evaluate the prevalence, severity, and consequences of LBP. The electronic survey written in English included forced-choice, multiple-choice, and binary-response formats. It covered 12-month and 7-day LBP prevalence. The 7-day prevalence of low back pain was calculated among participants who reported experiencing low back pain in the past 12 months. This approach was chosen to better reflect the short-term recurrence of pain in individuals with a recent history of low back pain. For manual lifting, a straightforward Yes/No question was used, as measuring how often, how much, or how long items are lifted is not easily assessed in typical workplace conditions. Weight and height were measured using a digital smart scale in each department, in a private room to ensure privacy, before completing the questionnaire, and BMI was calculated. To confirm accuracy, a second device was used for verification. The questionnaire was anonymous, minimizing any motivation to misreport weight. Pain intensity (measured on a 0–10 numeric scale, where 0 indicates no pain and 10 the worst imaginable pain). [25] Additional items included impact on work performance over the past year, history of lower back injury due to accidents, duration of LBP (1–7 days, 8–30 days, >30 days, or daily), and whether participants sought medical consultation for LBP in the past 12 months.

Age was categorized into four groups: 22–30, 31–40, 41–50, and 51-60. Work experience was grouped as 3 months–<1 year, 1–<5 years, 5–<10 years, and >10 years.

Pain intensity was measured using the Numeric Rating Scale (0–10), categorized as mild (1–3), moderate (4–6), severe (7–9), and worst possible (10).[25]

Convenience sampling was used for this study. The research team briefed the hospital's head nurse, who communicated the study details to charge nurses in each participating ward. The charge nurses explained the study to on-duty nurses in each ward, and those who met the inclusion criteria, did not meet any of the exclusion criteria, and agreed to participate were invited to meet in the ward's seminar room, where the electronic survey link was distributed. Shift schedules are fairly distributed among nurses, and some are assigned fixed morning shifts according to unit requirements. Nurses from all shifts (morning, afternoon, and night) were invited to participate by completing a self-administered questionnaire in English, which took approximately 2–3 minutes. Although the majority of participants were Omani, all were proficient in English as part of their professional nursing education. A pilot test was conducted among 10 nurses to ensure clarity and comprehension of the questionnaire item. The researcher, maintained direct communication with the nursing supervisors to address any questions or concerns related to the questionnaire. The survey was conducted using Google Forms. Responses were stored securely on Google Drive with access limited to the research team. All sociodemographic, clinical factors, and work-related questions were marked as mandatory to ensure completeness of key variables. Incomplete responses were excluded from analysis. The denominator was uncertain due to the unknown total number of nurses who received the survey link.

Low back pain was defined as pain or discomfort localized below the costal margin and above the inferior gluteal folds, with or without leg pain, lasting for at least one day within the past 12 months. A 12-month recall period was used to capture a broader context of low back pain, despite the 3-month employment inclusion criterion, as previous episodes may impact current symptoms and work performance.

Body Mass Index (BMI) was classified into three groups: underweight (BMI < 18.5), normal weight (BMI 18.5–24.9), and overweight or obese (BMI > 25).

Exposure variables included age, gender, nationality, education level, comorbidities, surgical history, BMI, ward type, work experience, shift type, manual lifting, and staffing adequacy.

Outcome variable was the self-reported presence of LBP during the past 12 months.

Collected data were entered, coded, and cleaned in Microsoft Excel. Analyses were performed using SPSS version 26 and Excel. Data were collected using anonymous questionnaires, so imputation was not feasible; therefore, we used complete-case analysis. Categorical variables were summarized as frequencies and percentages. Associations were assessed using Chi-squared tests and crude odds ratios. Binary logistic regression analysis was used to identify predictors of LBP, with statistical significance set at P <0.05.

The study received ethical approval (43/2024) from the North Al-Batinah Governorate Research and Ethical Review & Approval Committee. All participants were informed about the study objectives and provided consent. Participation was voluntary, and all data were anonym zed, kept confidential, and accessible only to the research team for study purposes. To eliminate any possibility of indirect pressure on nurses to participate in the study, nursing supervisors are not able to access the responses or identify who participated.

Results

The completion rate was 100% (385 nurses), with 317 (82.34%; 95% CI: 78.5–86.1) reporting LBP. Figure 1 shows the prevalence of LBP among nurses over the past 12 months.

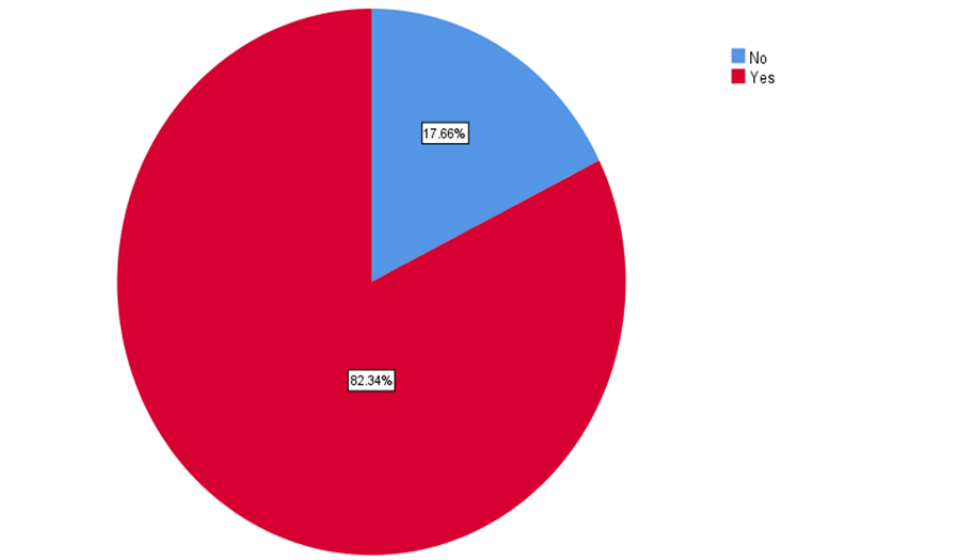

Figure 1: last 12 months Prevalence of low back pain among nurses at Sohar Hospital.

Most participants were aged 31–40 199 (51.69%), female 360 (93.51%), Omani citizen 202 (52.47%), married 332 (86.23%), and held bachelor's degrees 210 (54.55%). LBP was most prevalent among nurses aged 22–30 years 107 (84.25%), females 298 (82.78%), Omani citizen 182 (90.20%), and married participants 275 (82.83%). Nurses with bachelor's degrees showed a higher proportion of LBP, 179 (85.24%), than those with postgraduate degrees, 17 (70.83%).(Table 1).

Table 1: Sociodemographic Variables associated with LBP among nurses at Sohar Hospital (N = 385).

Variables	Total, n (%)	LBP (Yes), n (%)	COR (95% CI)	Crude *p*-value	AOR (95% CI)	Adjusted *p*-value
Age (years)						
22–30	127 (32.99%)	107 (84.25%)	Ref		Ref	
31–40	199 (51.69%)	162 (81.41%)	0.82 (0.45–1.49)	0.510	1.938 (0.676–5.558)	0.219
41–50	44 (11.43%)	37 (84.09%)	0.99 (0.39–2.53)	0.980	2.985 (0.673–13.250)	0.150
51–60	15 (3.90%)	11 (73.33%)	0.51 (0.15–1.78)	0.293	2.301 (0.356–14.881)	0.382
Gender						
Male	25 (6.49%)	19 (76%)	Ref		Ref	
Female	360 (93.51%)	298 (82.78%)	1.52 (0.58–3.96)	0.393	3.972 (1.061–14.879)	0.041*
Nationality						
Omani citizen	202 (52.47%)	182 (90.10%)	Ref		Ref	
Non-Omani citizen	183 (47.53%)	135 (73.77%)	0.31 (0.18–0.55)	0.001*	0.149 (0.057–0.392)	<0.001*
Education						
Diploma	151 (39.22%)	121 (80.13%)	Ref		Ref	
Bachelor	210 (54.55%)	179 (85.24%)	1.43 (0.83–2.49)	0.203	1.667 (0.773–3.597)	0.193
Postgraduate	24 (6.23%)	17 (70.83%)	0.60 (0.23–1.58)	0.304	0.709 (0.230–2.184)	0.550
Marital status						
Married	332 (86.23%)	275 (82.83%)	Ref		Ref	
Single	53 (13.77%)	42 (79.25%)	0.79 (0.38–1.63)	0.526	0.545 (0.215–1.383)	0.201

LBP = lower back pain; COR = crude odds ratio; CI = confidence interval; AOR = adjusted odds ratio. Percentages in the 'Total' column are based on the overall sample (n = 385), while those in the 'LBP (Yes)' column represent the proportion with low back pain within each variable category.

Among all participants (n = 385), 55.84% reported experiencing low back pain in the past seven days. These figures, when considered among those who reported low back pain in the past 12 months (n = 317), indicate that 215 (67.82%) experienced pain in the past seven days, while 102 (32.18%) did not report any pain during the same period. Over the past year, 170 (53.63%) experienced LBP for 1–7 days, 34 (10.73%) for over 30 days, and 68 (21.45%) daily. Moderate pain was the most common 160 (50.47%), and in 7 (2.21%), the pain was the worst. As a consequence of low back pain, 108 (34.07%) required medical consultation, and 149 (47.00%) experienced functional impairment that prevented them from performing routine occupational tasks. Among the respondents, 39 (12.30%) reported a prior injury to the lower back area due to an accident. (Table 2).

Table 2: Duration, severity, and consequences of LBP among nurses at Sohar Hospital in 2024 (N = 385).

	Frequency (%)

Prevalence of LBP during past 12 months	317 (82.34%)
Prevalence of LBP during last week	215 (67.82%)
Duration of LBP in past 12 month	
1–7 Days	170 (53.63%)
8–30 Days	45 (14.20%)
More than 30 Days	34 (10.73%)
Daily	68 (21.45%)
Severity	
Mild	59 (18.61%)
Moderate	160 (50.47%)
Severe	91 (28.71%)
Worst possible	7 (2.21%)
Consequences	
Need medical consultation	108 (34.07%)
Inability to perform normal work	149 (47.00%)
Prior injury to the lower back area due to an accident	
Yes	39 (12.30%)
No	278 (87.70%)

LBP = lower back pain. Note: The 7-day prevalence was calculated only among those who reported low back pain in the past 12 months (n = 317), not the entire sample (n = 385).

Most nurses reported no comorbidities 345 (89.61%) or surgical history 238 (61.82%), and 240 (62.34%) had normal weight. LBP was more common among nurses with comorbidities 33 (82.50%), prior surgical 131 (89.12%), or overweight/obese 113 (89.69%). (Table 3.)

Table 3: Medical variables associated with LBP among nurses at Sohar Hospital (N = 385).

Variables	Total, n (%)	LBP(Yes), n (%)	COR (95% CI)	Crude *p*-value	AOR (95% CI)	Adjusted *p*-value
Co-morbidities						
Yes	40 (10.39%)	33 (82.50%)	1.01 (0.43–2.40)	0.977	0.782 (0.268–2.280)	0.653
No	345 (89.61%)	284 (82.32%)	Ref		Ref	
Surgical history						

Yes	147 (38.18%)	131 (89.12%)	2.29 (1.25–4.18)	0.007*	3.149 (1.518–6.533)	0.002*
No	238 (61.82%)	186 (78.15%)	Ref		Ref	
Body Mass Index						
Underweight (BMI <18.5)	19 (4.94%)	17 (89.47%)	Ref		Ref	
Normal weight (BMI 18.5-24.9)	240 (62.34%)	187 (77.92%)	0.42 (0.09–1.85)	0.250	0.388 (0.075–2.008)	0.259
Overweight or Obese (BMI >25)	126 (32.73%)	113 (89.69%)	1.02 (0.21–4.93)	0.978	0.904 (0.160–5.103)	0.909

LBP = lower back pain; COR = crude odds ratio; CI = confidence interval; AOR = adjusted odds ratio. Percentages in the 'Total' column are based on the overall sample (n = 385), while those in the 'LBP (Yes)' column represent the proportion with low back pain within each variable category.

The largest work groups were in coronary care 56 (14.55%), the labor room 54 (14.03%), and obstetrics/gynecology 47 (12.21%). Most nurses worked across all shifts 353 (91.69%), and 164 (42.60%) had over 10 years of experience, while 15 (3.90%) had work experience of one year or less. Additionally, 332 (86.23%) of nurses in this study reported that their work involved manual patient handling. Regarding staff shortages, 204 (52.99%) of nurses perceived staffing inadequacy in their workplace. LBP was most frequent in the female surgical 26 (92.86%) and male internal medicine wards 11 (91.67%), among those on fixed morning shifts 27 (84.38%), with 1–5 years' experience 91 (85.05%), involved in manual lifting 275 (82.83%), and in understaffed units 180 (88.24%). (Table 4).

Table 4: Work related variables associated with LBP among nurses at Sohar Hospital (N = 385).

Variables	**Total, n (%)**	**LBP (Yes), n (%)**	**COR (95% CI)**	**Crude *p*-value**	**AOR (95% CI)**	**Adjusted *p*-value**
Wards						
Accident and Emergency	27 (7.01%)	20 (74.07%)	Ref		Ref	
Coronary Care Unit	56 (14.55%)	48 (85.71%)	2.100 (0.671–6.570)	0.202	3.520 (0.941–13.163)	0.061
Day Care	17 (4.42%)	15 (88.24%)	2.625 (0.476–14.486)	0.268	0.995 (0.129–7.678)	0.996
Female Internal Medicine	23 (5.97%)	21 (91.30%)	3.675 (0.680–19.848)	0.130	11.022(1.570–77.383)	0.016*
Female Surgical Ward	28 (7.27%)	26 (92.86%)	4.550 (0.851–24.318)	0.076	4.301 (0.692–26.718)	0.117
ICU	14 (3.64%)	11 (78.57%)	1.283 (0.275–5.984)	0.751	2.057 (0.333–12.704)	0.438
Labor Room	54 (14.03%)	37 (68.52%)	0.762 (0.271–2.144)	0.606	1.165 (0.349–3.881)	0.804
Male Internal Medicine	12 (3.12%)	11 (91.67%)	3.850 (0.418–35.473)	0.234	6.214 (0.572–67.564)	0.133
Male Surgical Ward	27(7.01%)	20 (74.07%)	1.000 (0.296–3.378)	1.000	1.110 (0.256–4.815)	0.889
Maternal Ward	29 (7.53%)	24 (82.76%)	1.680 (0.462–6.115)	0.431	1.005 (0.214–4.720)	0.995
Obstetrics and Gynecology	47 (12.21%)	38 (80.85%)	1.478 (0.479–4.558)	0.497	1.486 (0.401–5.501)	0.553

Operation Theater	15 (3.90%)	13 (86.67%)	2.275 (0.408–12.700)	0.349	2.362 (0.357–15.644)	0.373
Pediatric Ward	36 (9.35%)	33 (91.67%)	3.850 (0.892–16.613)	0.071	3.507 (0.643–19.114)	0.147
Fixed morning shift						
Yes	32 (8.31%)	27 (84.38%)	Ref		Ref	
No	353 (91.69%)	290 (82.15%)	0.85 (0.32–2.30)	0.753	1.562 (0.474–5.144)	0.463
Years of Experience						
3 months–<1 year	15 (3.90%)	12 (80.00%)	Ref		Ref	
1–<5 years	107 (27.79%)	91 (85.05%)	1.42 (0.36–5.61)	0.615	0.741 (0.146–3.753)	0.717
5–<10 years	99 (25.71%)	82 (82.83%)	1.21 (0.31–4.74)	0.789	1.154 (0.214–6.219)	0.868
10 years and more	(164)(42.60%)	132 (80.49%)	1.03 (0.28–3.87)	0.964	1.162 (0.200–6.761)	0.867
Manual Lifting						
Yes	332 (86.23%)	275 (82.83%)	Ref		Ref	
No	53 (13.77%)	42 (79.25%)	0.79 (0.38–1.63)	0.526	1.240 (0.519–2.962)	0.629
Enough staff per shift						
Yes	181 (47.01%)	137 (75.69%)	Ref		Ref	
No	204 (52.99%)	180 (88.24%)	2.41 (1.40–4.15)	0.002*	2.316 (1.160–4.624)	0.017*

LBP = lower back pain; COR = crude odds ratio; CI = confidence interval; AOR = adjusted odds ratio; ICU = intensive care unit. Percentages in the 'Total' column are based on the overall sample (n = 385), while those in the 'LBP (Yes)' column represent the proportion with low back pain within each variable category.

The prevalence of low back pain was higher among Omani citizen nurses (182) (90.10%) compared to non-Omani citizen nurses (135) (74.18%). Crude analysis indicated that being a non-Omani citizen nurse was a protective factor (COR = 0.31, 95% CI: 0.18–0.55, P = 0.001), whereas being an Omani citizen nurse was associated with an increased risk of low back pain. According to the crude analysis, age, gender, level of education, and marital status were not significantly associated with low back pain among nurses, as shown in Table 1.

Among nurses with low back pain, those with a history of surgical procedures were more prevalent (131) (89.12%) compared to those without a surgical history (286) (78.15%). Crude analysis indicated that having a history of surgical procedures was significantly associated with low back pain (COR = 2.29, 95% CI: 1.25–4.18, p = 0.007).

Crude analysis demonstrated that body weight and the presence of comorbidities were not statistically significant factors associated with low back pain among nurses. Details of the crude analysis for medical-related variables are presented in Table 3.

Low back pain was more prevalent among nurses working in wards with perceived inadequate staffing (180) (88.24%) compared to those in adequately staffed wards (137) (75.69%). This difference was statistically significant, with a crude odds ratio (COR = 2.41, 95% CI: 1.40–4.15, p = 0.002), indicating that staff shortage is a significant associated factor. As shown in Table 4, other variables such as ward type, work shifts, years of

experience, and manual patient lifting were not significantly associated with low back pain among nurses at Sohar Hospital based on crude analysis.

Adjusted analysis confirmed that a history of surgical procedures was strongly associated with increased odds of LBP (AOR = 3.15; 95% CI: 1.52–6.53; P = 0.002). Perceived inadequate staffing per shift was significantly associated with increased LBP prevalence (AOR = 2.32; 95% CI: 1.16–4.62; P = 0.017). Nationality was also significantly associated factor: non-Omani nurses were less likely to experience LBP (AOR = 0.149; 95% CI: 0.06–0.39; P < 0.001) compared to Omani nurses. Female gender was a significant predictor of LBP (AOR = 3.97; 95% CI: 1.06–14.88; P = 0.041). Additionally, nurses assigned to the female internal medicine ward had significantly elevated odds of experiencing LBP (AOR = 11.02; 95% CI: 1.57–77.38; P = 0.016) compared to those in the accident and emergency unit.

Discussion

This study investigated the prevalence and associated factors of low back pain (LBP) among nurses at Sohar Hospital, revealing a notably high 12-month prevalence of 82.34%. Prevalence was higher among nurses aged 22–30 years, females, Oman citizen, and married nurses. Increased prevalence was also observed among those with a bachelor's degree, those who were overweight or obese, and nurses working in the female surgical ward. Additionally, the prevalence of LBP was greater among nurses who worked morning shifts only, those involved in manual patient handling, and those in wards with a nursing staff shortage. Significant associations were found between LBP and being female, being an Omani citizen, having a history of surgical procedures, working in the female internal medicine ward, and experiencing staff shortages.

This rate aligns with global reports from several studies [2,26],indicating that low back pain (LBP) is a common occupational health problem among nurses, attributable to the physical demands of nursing roles. It is slightly lower than the rate reported in Slovenia (85.9%)[27] and the Czech Republic (84.7%),[28] and higher than those in Italy (62%),[12] Africa (63.6%),[13] and Qatar (54.3%).[15] These variations may be attributed to occupational conditions, institutional practices, or societal factors specific to each region.

LBP was most prevalent among nurses aged 22–30 years (84.25%), a finding consistent with studies from Saudi Arabia.[29,30] This age group may be more engaged in physically demanding tasks, such as lifting heavy patients or prolonged standing.

LBP had a higher prevalence among female nurses (298) (82.78%), as reported in other studies as well.[31,32] It was found to be a significant associated factor for low back pain in this study. This may be attributable to both biological factors—such as differences in musculoskeletal structure and hormonal influences—and sociocultural expectations that increase workload burden.[33]

The prevalence of low back pain (LBP) in this study was higher among Omani citizen nurses (90.10%), which is consistent with the findings of another relevant study.[34] This was identified as a significant associated factor. This may be attributed to cultural norms, lifestyle factors, and occupational roles.[35]

The prevalence was also high among married nurses (82.83%), which is consistent with findings from other studies.[32,36,37] This can be explained by the fact that this specific group has stronger family connections and more social obligations, which contribute to reduced physical activity, increased weight, and, as a result, a higher risk of low back pain.

Among the participating nurses, those holding a bachelor's degree reported the highest prevalence of LBP (85.24%), a finding that aligns with results from another study.[26] The reason for this may be that nurses with higher academic qualifications often engage in office and administrative work, which increases the risk of developing low back pain.

As reported in this study, LBP had a higher prevalence among overweight or obese nurses (89.69%), which is consistent with another study.[16] This can be explained by the fact that extra weight increases strain on the spine, contributing to pain.

The prevalence of low back pain was significantly higher among nurses working in the female internal medicine ward (91.3%) and was identified as a statistically significant associated factor. Nursing patients in this ward requires manual handling—such as lifting or transferring—and prolonged standing, all of which increase the risk of low back pain. The prevalence was lower in a previous study conducted in Saudi Arabia (18.8%).[2] The differences may be due to variations in facilities at each health institute, differences in staff-to-patient ratios, and the specific demands of each ward.

Nurses who worked exclusively morning shifts reported a higher prevalence of LBP (84.38%). A similar finding was observed in a study conducted in Malaysia.[38] This may be due to the increased number of patients admitted to hospital wards during the morning shift, placing more physical demands on nurses.

The prevalence of LBP was higher among nurses who handle patients manually (82.83%), which has also been reported in several other studies.[10,20] This can be explained by the repetitive lifting, poor posture, and physical strain associated with patient transfers.

The prevalence of LBP also was higher among nurses with surgical history (89.12%). A similar result has been reported in another study.[39] This was identified as a significant predictor. The reason may be that nurses with a surgical history have weaker muscle structure and reduced physical activity, making them susceptible to low back pain. Further studies are needed to explore the underlying causes.

Perceived staffing inadequacy was also found to contribute to the high prevalence of LBP (88.24%), as reported in another study.[20] This factor was also identified as a significant associated factor in the present study. Staff shortages may increase the workload for each nurse, leading to greater physical strain and back-related injuries.

While this study provides valuable insights into the prevalence and associated factors of LBP among nurses at Sohar Hospital, several limitations should be acknowledged: as a single‑center study conducted at one hospital, the findings may not be generalizable to nurses working in different healthcare settings or geographic regions, and the use of convenience sampling may limit generalizability. Due to the very small number of obese participants and their limited exposure to physical strain, they were combined with the overweight group to ensure stability of the statistical analysis; however, this may have limited the ability to observe a dose-response relationship between BMI and low back pain. Although odds ratios may be overestimated due to the high prevalence of LBP, logistic regression was appropriate as the study aimed to identify associations rather than quantify their exact strength. Potential confounding variables: although multiple factors were adjusted for, unmeasured variables such as psychosocial factors, physical fitness, family size, home responsibilities and exact ergonomic practices might influence LBP prevalence. Causality and recall bias: the cross‑sectional design limits the ability to establish causal relationships, and there is a possibility of recall bias. Limited objective measures: the study did not include objective assessments of physical workload or clinical evaluations of LBP, which could strengthen the validity of the findings, as this study depends on self‑reported data.

Based on the findings of this study, several recommendations are proposed to address the high prevalence of low back pain (LBP) among nurses at Sohar Hospital: 1. Enhance staffing levels : given the significant association between perceived staffing inadequacy and LBP, hospital management should prioritize adequate nurse‑to‑patient ratios to reduce workload‑related musculoskeletal strain. 2. Ergonomic interventions: implement targeted ergonomic training programs focusing on safe patient‑handling techniques and posture correction, especially in wards with higher LBP prevalence such as female internal medicine. 3. Health screening and rehabilitation: establish regular occupational health assessments to identify nurses with a history of surgical procedures or musculoskeletal conditions, and provide timely rehabilitation and support to prevent exacerbation of LBP. 4. Gender‑ and culture‑sensitive programs: develop culturally appropriate health‑promotion initiatives that consider the differing risks observed between Omani citizen and non-Omani citizen nurses, and address the higher vulnerability among female staff. 5. Awareness and education: promote awareness about LBP risk factors and self‑care strategies among nurses, emphasizing early reporting of symptoms and seeking medical consultation to reduce chronicity and functional impairment. 6. Further research: conduct longitudinal and intervention studies to evaluate the effectiveness of preventive measures and to explore additional risk factors such as psychosocial stressors, shift patterns, and physical activity levels

Conclusion

This study demonstrates a substantially high prevalence of low back pain among nurses at Sohar Hospital, highlighting a significant occupational health concern within this population. The findings indicate that female gender, Omani citizen, a history of prior surgical intervention, perceived inadequate staffing, and employment in specific clinical wards are independently associated with increased risk of low back pain. These results emphasize the multifactorial nature of low back pain etiology in nursing professionals, encompassing demographic, medical, and workplace-related determinants.

Disclosure

The authors declared no conflict of interests. No funding was received for this study.

References

1. Kanakkarthodi R, Edakalathur Baby B, Anapattath AN, Kallikkattu Valappil J, Afsar A, Jakribettu RP, et al. Low Back Pain Among Nurses in a Tertiary Care Teaching Hospital at Malappuram Kerala. Cureus. 2022;14(11).

2. Almaghrabi A, Alsharif F. Prevalence of low back pain and associated risk factors among nurses at king abdulaziz university hospital. Int J Environ Res Public Health. 2021;18(4):1–11.

3. Khumalo K, Haffejee F. Prevalence and associated risk factors of low back pain among users of a primary health care clinic serving semi-urban and rural settlements in KwaZulu-Natal, South Africa. Afr Health Sci. 2022 Jun;22(2):592–601.

4. Becker BA, Childress MA. Nonspecific Low Back Pain and Return To Work. Am Fam Physician. 2019 Dec;100(11):697–703.

5. Ali Alabdali A, Al-Noumani H, Al Harrasi TK, Al Daghaishi AA, Al Rasbi MA, Alaamri HK, et al. Low back pain knowledge and associated disability among nursing staff in Oman. Int J Orthop trauma Nurs. 2024 May;53:101085.

6. Aleku M, Nelson K, Abio A, Lowery Wilson M, Lule H. Lower Back Pain as an Occupational Hazard Among Ugandan Health Workers. Front Public Heal. 2021;9(December).

7. Ferreira ML, De Luca K, Haile LM, Steinmetz JD, Culbreth GT, Cross M, et al. Global, regional, and national burden of low back pain, 1990–2020, its attributable risk factors, and projections to 2050: a systematic analysis of the Global Burden of Disease Study 2021. Lancet Rheumatol. 2023;5(6):e316–29.

8. Babu AN, McCormick Z, Kennedy DJ, Press J. Local, national, and service component cost variations in the management of low back pain: Considerations for the clinician. J Back Musculoskelet Rehabil. 2016 Nov;29(4):685–92.

9. Kassebaum NJ, Arora M, Barber RM, Brown J, Carter A, Casey DC, et al. Global, regional, and national disability-adjusted life-years (DALYs) for 315 diseases and injuries and healthy life expectancy (HALE), 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. Lancet. 2016;388(10053):1603–58.

10. Cavdar I, Karaman A, Ozhanli Y, Ozbas A. Low back pain in operating room nurses and its associated factors. Pakistan J Med Sci. 2020;36(6):1291–6.

11. Ababa A, M Belay EM, Worku A, Gebrie SA, Wamisho BL. Epidemiology of Low Back Pain among Nurses Working in Public Hospitals of. Afr J surg COSECSA/ASEA Publ -East Cent African J Surg East Cent Afr J surg COSECSA/ASEA Publ -East Cent African J Surg. 2016;21(211):2073–9990.

12. Lorusso A, Bruno S, L'Abbate N. A review of low back pain and musculoskeletal disorders among Italian nursing personnel. Ind Health. 2007;45(5):637–44.

13. Mekonnen TH. Work-Related Factors Associated with Low Back Pain Among Nurse Professionals in East and West Wollega Zones, Western Ethiopia, 2017: A Cross-Sectional Study. Pain Ther. 2019 Dec;8(2):239–47.

14. Jradi H, Alanazi H, Mohammad Y. Psychosocial and occupational factors associated with low back pain among nurses in Saudi Arabia. J Occup Health. 2020;62(1):1–7.

15. Abolfotouh SM, Mahmoud K, Faraj K, Moammer G, ElSayed A, Abolfotouh MA. Prevalence, consequences and

predictors of low back pain among nurses in a tertiary care setting. Int Orthop [Internet]. 2015;39(12):2439–49. Available from: https://doi.org/10.1007/s00264-015-2900-x

16. Banga D, Samuel T, Yihune M, Bekele G, Molla E, Borie YA, et al. Prevalence of low back pain and associated factors among nurses working in public hospitals of Hawassa city, southern Ethiopia: A cross-sectional study. Heliyon [Internet]. 2024;10(9):e30300. Available from: https://doi.org/10.1016/j.heliyon.2024.e30300

17. Ghilan K, Al-Taiar A, Yousfi N Al, Zubaidi R Al, Awadh I, Al-Obeyed Z. Low back pain among female nurses in Yemen. Int J Occup Med Environ Health. 2013;26(4):605–14.

18. Chen HM, Huang PY, Chuang HY, Wang CL, Yang CC, Huang PJ, et al. Association of Low Back Pain with Shift Work: A Meta-Analysis. Int J Environ Res Public Health. 2023 Jan;20(2).

19. Samaei SE, Mostafaee M, Jafarpoor H, Hosseinabadi MB. Effects of patient-handling and individual factors on the prevalence of low back pain among nursing personnel. Work. 2017;56(4):551–61.

20. Sanjoy SS, Ahsan GU, Nabi H, Joy ZF, Hossain A. Occupational factors and low back pain: a cross-sectional study of Bangladeshi female nurses. BMC Res Notes. 2017 Apr;10(1):173.

21. Attia RM, Shaheen WA, Al Harrasi NS, Al Toubi AK. Relationship Between Ergonomic Awareness and Work-related Musculoskeletal Disorders Among Staff Nurses in Oman: An Observational Study. Oman Med J. 2023;38(4).

22. Kuorinka, I.; Jonsson, B.; Kilbom, A.; Vinterberg, H.; Biering‐Sørensen, F.; Andersson, G.; Jørgensen K. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. Appl Ergon. 1987;18(3):233–237.

23. Kim, Seung‐Sup; Okechukwu, Cassandra; Dennerlein, Jack T.; Boden, Leslie I.; Hopcia, Karen; Hashimoto, Dean M.; Sorensen G. Association between perceived inadequate staffing and musculoskeletal pain among hospital patient care workers. Int Arch Occup Environ Health. 2013;87(3):323‐330.

24. Dawson AP, Steele EJ, Hodges PW, Stewart S. Development and Test-Retest Reliability of an Extended Version of the Nordic Musculoskeletal Questionnaire (NMQ-E): A Screening Instrument for Musculoskeletal Pain. J Pain [Internet]. 2009;10(5):517–26. Available from: http://dx.doi.org/10.1016/j.jpain.2008.11.008

25. Vieira ER, Kumar S, Coury HJCG, Narayan Y. Low back problems and possible improvements in nursing jobs. J Adv Nurs. 2006 Jul;55(1):79–89.

26. Zaitoon RA, Said NB, Snober RH, Hussein RF, Abdoon AH, Shehadeh AMA, et al. Low back pain prevalence and associated factors among nurses: cross sectional study from Palestine. BMC Public Health. 2024;24(1):1–8.

27. Skela-Savič B, Pesjak K, Hvalič-Touzery S. Low back pain among nurses in Slovenian hospitals: cross-sectional study. Int Nurs Rev. 2017 Dec;64(4):544–51.

28. Gilchrist A, Pokorná A. Prevalence of musculoskeletal low back pain among registered nurses: Results of an online survey. J Clin Nurs. 2021 Jun;30(11–12):1675–83.

29. Abuzeid Atta Elmannan A, AlHindi HA, AlBaltan RI, AlSaif MS, Almazyad NS, Alzurayer RK, et al. Non-specific Low Back Pain Among Nurses in Qassim, Saudi Arabia. Cureus. 2021;13(11).

30. Alshahrani A. Prevalence of Low Back Pain among Nursing Staff in Najran, Saudi Arabia: A Cross-Sectional Study. Med Sci (Basel, Switzerland). 2020;8(4):1–9.

31. Sun W, Zhang H, Tang L, He Y, Tian S. The factors of non-specific chronic low back pain in nurses: A meta-analysis. J Back Musculoskelet Rehabil. 2021;34(3):343–53.

32. Zewudie BT, Temere BC, Eniyew MA, Mesfin Y, Tenaw SG. Low back pain and associated factors among obstetrics care providers in public hospitals of Amhara Regional State, Ethiopia: a cross-sectional study. BMJ Open. 2022 Jun;12(6):e055749.

33. Alcouffe J, Manillier P, Brehier M, Fabin C, Faupin F. Analysis by sex of low back pain among workers from small companies in the Paris area: Severity and occupational consequences. Occup Environ Med. 1999;56(10):696–701.

34. Al-Zadjali N, Al-Khaldi S, Samir N, Rizvi S, Al-Zakwani I, Al-Mahrezi A. Characteristics of chronic pain patients attending a primary health care center in Oman. Oman Med J. 2017;32(6):461–6.

35. Altug Z. Lifestyle Medicine for Chronic Lower Back Pain: An Evidence-Based Approach. Am J Lifestyle Med. 2021;15(4):425–33.

36. Rasheed H, Rashid J, Javeed RS. Frequency of Low Back Pain among Nurses Working in Jinnah Hospital Lahore. Int J Endorsing Heal Sci Res. 2017;5(3):44.

37. Adhikari S, Dhakal G. Prevalent Causes of Low Back Pain and its Impact among Nurses Working in Sahid Gangalal National Heart Centre. J Nepal Health Res Counc. 2014;12(28):167–71.

38. Gim CS. Factors Associated with Low Back Pain Among Nurses in Critical Care Units, Hospital Universiti Sains Malaysia. Biomed J Sci Tech Res. 2017;1(7).

39. Al Mulhim FA, Alalwan HA, Alkhars AM, Almutairi A, AlSaeed MN, Althabit FM. Prevalence of Low Back Pain and Its Related Risk Factors and Disability Following Lumbar Discectomy: A Single-Center Study. Cureus. 2023;15(11).