



Perceived Determinants of Work-Related Low Back Pain Among Nurses at Rivers State University Teaching Hospital, Port Harcourt

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Abstract

Work-related lower back pain (LBP) remains a significant occupational health challenge among nurses globally, affecting their physical well-being, job performance, and overall quality of care delivery. The study was guided by three objectives, three research questions, and one hypothesis. The study adopted a descriptive cross-sectional survey design, with a target population of 258 nurses from which a sample of 158 respondents was selected using a simple random sampling technique. Data were collected using a structured self-administered questionnaire comprising sections on socio-demographic characteristics, prevalence of LBP, perceived determinants, effects on job performance, and work environment factors. The instrument was validated through content validity and its reliability established using the test-retest method with 20 nurses, yielding acceptable reliability coefficients ranging from 0.63 to 0.73. The study found a high prevalence of work-related lower back pain among nurses (82.7%), with significant associations with prolonged standing (90.2%), manual lifting of patients (88.6%), and heavy workload (85.4%). The condition was found to severely affect job performance, including reduced strength at work (78.5%), difficulty performing nursing procedures (74.7%), and inability to complete tasks on time (71.5%). The study further revealed that work environment factors such as high patient-to-nurse ratio, inadequate staffing, and long working shifts significantly contributed to the occurrence of LBP. The theoretical framework was based on Cooper and Marshall's (1976) Work-Related Stress Model, which explains how work-related stressors lead to occupational illness. The study concludes that work-related lower back pain is highly prevalent among nurses and significantly affects their job performance. Recommendations include implementation of ergonomic interventions, regular training on proper body mechanics, adequate staffing, and provision of mechanical lifting devices to reduce the burden of work.

Keywords: Perceived Determinants, Work-Related Lower Back Pain, Nurses, Rivers State University Teaching Hospital

Introduction

The nursing profession stands at the forefront of healthcare delivery, with nurses spending more time with patients than any other healthcare professional. This unique position, while essential for quality patient care, exposes nurses to various occupational health hazards, among which work-related lower back pain (LBP) remains one of the most prevalent and debilitating. The global burden of lower back pain has reached epidemic proportions, affecting millions of workers across sectors, with healthcare workers, particularly nurses, bearing a disproportionate share of this burden. Lower back pain is a painful condition affecting the lower portion of the spine, associated with injury to muscles, bones, tendons, or ligaments from improper posture, poor lifting techniques, fractures, ruptured discs, or inflammation of the structures around the lower back (Mayo Clinic, 2023). The GBD 2021 Low Back Pain Collaborators (2023) reported that in 2020 approximately 619 million cases of lower back pain were recorded globally, and this number is projected to reach 843 million by 2050, with the highest increases anticipated in Asia and Africa. The regions with the highest occurrence in 2020 were Central Europe, Eastern Europe, and Australia, while the projected increase by

2050 will be driven primarily by population growth and ageing, particularly in Asia and Latin America. Lower back pain has been adjudicated the leading cause of disability worldwide, affecting individuals' quality of life, productivity, and overall wellbeing (GBD 2021 Low Back Pain Collaborators, 2023).

The prevalence of lower back pain among healthcare workers, particularly nurses, has been a growing concern in occupational health research. This concern is especially acute in Africa, where healthcare systems often face challenges such as inadequate staffing, limited resources, and insufficient attention to occupational health and safety. Studies across the African continent have reported alarmingly high prevalence rates of lower back pain among nurses. In a systematic review of 19 studies conducted between 2000 and 2018, Kasa et al. (2020) reported a prevalence range of 44.1% to 82.7% among 6,110 nurses working in clinical settings across Africa. This wide range highlights the significant burden of the condition and the need for context-specific interventions. In Nigeria, the situation is equally concerning. A systematic review of 12 studies by Bello and Bello Adebayo (2017) found that the 12-month prevalence of lower back pain among Nigerian workers ranged from 32.5% to 73.53%. The variation in prevalence rates across studies underscores the multifactorial nature of the condition and the influence of work-related and individual factors. More specifically for the nursing profession, Farooq et al. (2015) assessed work-related risk factors for lower back pain among nurses at Ahmadu Bello University Teaching Hospital, Shika-Zaria, and found a cumulative point-prevalence of 82.7%. This high prevalence is consistent with findings from other studies, suggesting that work-related lower back pain is endemic among Nigerian nurses.

The enormity of the problem extends beyond high prevalence rates. Work-related lower back pain among nurses has far-reaching consequences that affect not only the individual nurse but also the healthcare system and patients. The condition is associated with significant physical effects, including pain, deformity, immobility, and complications that can lead to a handicapped state. Initially, nurses experience muscle spasms in the lower back, which are often ignored. These spasms gradually progress to pain that comes and goes, eventually becoming more steady and severe, and extremely discomforting. The physical limitations imposed by lower back pain can severely impact a nurse's ability to perform essential job functions, including patient handling, prolonged standing, and the execution of various nursing procedures. Socially, the effects of lower back pain limit the nurse's interaction with the environment, especially activities of daily living such as walking, sitting, and standing. These limitations impair performance at work and reduce productivity, affecting both the quantity and quality of nursing care patients receive. The physical limitations often lead to social isolation, as nurses may be unable to participate in social activities that require physical mobility. Furthermore, the financial implications of lower back pain are substantial, as nurses may require medical treatment, incur hospitalisation costs, and experience reduced income due to absenteeism or the need to change jobs or leave the profession altogether.

Psychologically, the physical and social effects on nurses create significant distress. Nurses unable to deliver optimum services often face client dissatisfaction and employer displeasure, leading to job dissatisfaction and low self-esteem. This psychological burden can result in depression, anxiety, and consideration of quitting the profession (Ijadeniyi & Fasae, 2023). The combination of physical, social, and psychological effects creates a cascade of negative outcomes that affect not only the nurse's personal wellbeing but also their professional performance and career longevity. The economic implications of work-related lower back pain are substantial, both for individual nurses and the healthcare system. Tariq et al. (2023) reported that lower back pain adversely affects nurses, reducing wellbeing, job satisfaction, and overall quality of life, and increasing the risk of chronicity, associated personal and economic costs, reduced workforce efficiency, increased work absence, and burnout. These effects cause many nurses to consider leaving their jobs, contributing to the global nursing shortage and further burdening healthcare systems already struggling with inadequate staffing.

The causes and determinants of work-related lower back pain among nurses are multifactorial and complex. The nature of nursing work involves activities that place significant strain on the lower back. These include heavy manual lifting, working in awkward positions, pushing and pulling heavy objects, using vibrating or impact tools or equipment for extended periods, and habitual poor standing. Nurses are often required to adopt awkward postures during patient care activities, such as bending, twisting, and reaching, which place undue stress on the lumbar spine. The cumulative effect of these activities, when performed repeatedly over a working career, significantly increases the risk of developing lower back pain. Several work-related determinants of lower back pain among nurses have been identified in empirical research. Prolonged standing during nursing shifts has been consistently identified as a major risk factor,

with nurses often required to stand for hours at a time without adequate opportunities for rest. Manual patient handling, including lifting, transferring, and repositioning patients, is another significant determinant. The physical demands of these activities are often compounded by inadequate staffing, which increases workload and reduces the availability of assistance for heavy lifting. Work environment factors such as high patient-to-nurse ratios, long working shifts, and a lack of mechanical lifting devices further contribute to the risk of developing lower back pain.

Individual characteristics also play a role in the development of work-related lower back pain. These include age, gender, body mass index, level of physical fitness, and personal health practices. Studies have shown that older nurses, particularly those above 50 years of age, are at higher risk of developing lower back pain. Female nurses have been found to be at greater risk, possibly due to differences in physical strength and hormonal factors. Obesity and sedentary lifestyle are additional risk factors that predispose nurses to lower back pain. However, it is important to note that even nurses who maintain a healthy lifestyle and proper body mechanics are not immune to work-related lower back pain, given the physical demands of the profession. Various measures have been implemented to mitigate the problem of work-related lower back pain among nurses, with varying degrees of success. These measures can be broadly categorized into primary prevention (preventing the occurrence of injury), secondary prevention (early detection and intervention), and tertiary prevention (rehabilitation and management of established conditions). Primary prevention strategies include ergonomic interventions such as providing mechanical lifting devices, redesigning work environments to reduce physical strain, implementing safe patient handling policies, and training nurses on proper body mechanics and safe lifting techniques. Secondary prevention strategies include regular health surveillance, early reporting of musculoskeletal symptoms, and prompt treatment of work-related injuries. Tertiary prevention strategies include rehabilitation programs, pain management, and return-to-work programs.

International organizations and professional nursing bodies have developed guidelines and recommendations to address work-related lower back pain among nurses. The American Nurses Association (ANA, 2023) has emphasized the importance of healthy work environments for nurses and has called for the implementation of safe patient handling programs to reduce the risk of musculoskeletal injuries. Similarly, the World Health Organization (WHO, 2023) has recognized the importance of occupational health and safety for healthcare workers and has developed guidelines for the prevention of work-related injuries. Despite these efforts, the problem of work-related lower back pain among nurses persists, highlighting the need for continued research and context-specific interventions.

In Nigeria, various initiatives have been implemented to address work-related lower back pain among nurses, though with limited success. Some healthcare institutions have provided mechanical lifting devices and ergonomic equipment to reduce physical strain on nurses. Others have implemented training programmes on proper body mechanics and safe patient handling. However, these initiatives are often hampered by resource constraints, inadequate staffing, and limited awareness of occupational health issues among nurses and healthcare administrators. The lack of comprehensive occupational health policies and the absence of systematic surveillance of work-related injuries have hindered efforts to address the problem effectively. The role of research in understanding and addressing work-related lower back pain among nurses cannot be overstated. Empirical research is essential for documenting the prevalence of the condition, identifying its determinants, evaluating the effectiveness of interventions, and informing policy development. While several studies have been conducted on work-related lower back pain among nurses in various parts of the world, relatively few have focused on the Nigerian context. This gap in the body of knowledge limits policymakers' and healthcare administrators' ability to develop evidence-based interventions tailored to the specific needs of Nigerian nurses. This study therefore aimed to examine the perceived determinants of work-related lower back pain among nurses at Rivers State University Teaching Hospital, Port Harcourt. Specifically, the study sought to ascertain the prevalence of work-related lower back pain among nurses, identify the perceived determinants of the condition, and determine the effects of lower back pain on nurses' job performance. The findings of this study are expected to contribute to the body of knowledge on occupational health in nursing, provide evidence for policy development, and suggest preventive and curative measures to address the condition.

Nursing involves physically demanding activities such as lifting patients, working in awkward positions, pushing and pulling equipment, and prolonged standing, which can expose nurses to work-related lower back pain. Studies have reported a high prevalence of the condition among nurses, with Kasa et al. (2020) reporting a pooled prevalence of 65.2% in Africa, while Osunde et al. (2023) reported 61.15% among nurses at the University of Benin Teaching Hospital. These figures indicate that lower back pain remains a major occupational health concern among nurses.

Work-related lower back pain can lead to pain, reduced mobility, difficulty performing nursing duties, psychological distress, absenteeism, reduced productivity, and increased healthcare costs. Despite these effects, nurses may ignore early symptoms and continue working until the condition becomes severe. Factors such as inadequate staffing, limited ergonomic equipment, insufficient training, and poor occupational health practices may further increase the risk. At Rivers State University Teaching Hospital, Port Harcourt, nurses perform physically demanding duties amid challenges such as limited resources, inadequate staffing, and insufficient ergonomic support. However, the prevalence and perceived determinants of work-related lower back pain among nurses in this hospital have not been adequately established. The lack of hospital-specific evidence also makes it difficult to develop suitable preventive measures. Therefore, this study sought to determine the prevalence and perceived determinants of work-related lower back pain among nurses at Rivers State University Teaching Hospital, Port Harcourt, and to examine its effects on their job performance. The findings are expected to provide useful evidence for nurses, hospital management, nursing educators, and policymakers in developing appropriate occupational health and preventive measures.

This study aimed to examine the perceived determinants of work-related lower back pain among nurses in Rivers State University Teaching Hospital, Port Harcourt. Specifically, the objectives of the study were to:

1. Ascertain the prevalence of work-related lower back pain among nurses in Rivers State University Teaching Hospital, Port Harcourt.
2. Identify the perceived determinants of work-related lower back pain among nurses in Rivers State University Teaching Hospital, Port Harcourt.
3. Determine the effects of work-related lower back pain on job performance among nurses in Rivers State University Teaching Hospital, Port Harcourt.

The following research questions guided the study:

1. What is the prevalence of work-related lower back pain among nurses in Rivers State University Teaching Hospital, Port Harcourt?
2. What are the perceived determinants of work-related lower back pain among nurses in Rivers State University Teaching Hospital, Port Harcourt?
3. What are the effects of work-related lower back pain on job performance among nurses in Rivers State University Teaching Hospital, Port Harcourt?

Hypothesis

The following hypothesis was tested at a 0.05 level of significance:

H0: There is no significant relationship between work environment factors and the occurrence of work-related lower back pain among nurses in Rivers State University Teaching Hospital, Port Harcourt.

Methodology

The research design used in this study was a non-experimental descriptive cross-sectional survey. This design enabled the researcher to obtain vital information on the characteristics or determinants of a particular group, subject, institution, or the occurrence of a particular phenomenon at a specific point in time. This method was adopted because the researcher sought to elicit the perceived determinants of work-related lower back pain among nurses, rather than manipulate the independent variable with test and control groups to obtain a particular result (dependent variable). The cross-sectional survey design allowed for the collection of data from a sample of nurses at one point in time, enabling the estimation of the prevalence of work-related lower back pain and the identification of perceived determinants and effects on job performance. The study was conducted between June and August 2023 to examine perceived determinants of work-related lower back pain among nurses at Rivers State University Teaching Hospital, Port Harcourt. The facility is a tertiary health institution, formerly Braithwaite Memorial Hospital (BMH), which was established in March 1925 as a Nursing Home and originally served as a health facility for the Colonial Masters and senior civil servants. It later became a General Hospital and has since gained status as a Specialist Health Institution (Braithwaite Memorial Specialist Hospital - BMSH) before it was upgraded to serve as a University Teaching Hospital for the College of Medical Sciences of Rivers State University in 2018. The facility is located at No. 6/8 Harley Street, Old GRA of Port Harcourt, Rivers State, with a 375-bed capacity across 13 wards. The health institution offers several professional health services in its departments, including Medicine, Surgery, Nephrology, Chemical Pathology, Paediatrics, Laboratories, Radiology, Family Health, Obstetrics and Gynaecology, Anaesthesia, Medical Microbiology, Anatomical Pathology, Haematology and Blood Transfusion, Ophthalmology, Accident and Emergency, and Pharmacy. The health institution has about 258 nurses with general and specialty qualifications, along

with other medical and paramedical personnel rendering services to patients/clients in the wards and clinics of the hospital.

The target population for this study comprised all nurses working in Rivers State University Teaching Hospital, Port Harcourt, from the rank of Nursing Officer II to Chief Nursing Officer, without recourse to their ethnicity, race, sex, age, religion, wards, or department of work. According to the hospital's nursing department records, the total number of nurses in the hospital was 258. The sample size for this study was determined using Yamane's formula (Yamane, 1967). The formula is $n = N/(1+N(e^2))$, where n is the sample size, N is the population size, and e is the margin of error (0.05). With a population of 258 nurses, the sample size was calculated as $n = 258/(1+258(0.05^2)) = 258/(1+258(0.0025)) = 258/(1+0.645) = 258/1.645 = 156.8$, which was rounded up to 158 nurses. The sampling technique used was simple random sampling, which gave every nurse in the population an equal chance of being selected for the study. The procedure involved identifying all nurses working in Rivers State University Teaching Hospital from the nursing department staff list, assigning each nurse a unique number, and using a random number table to select 158 nurses for the study. The selected nurses were then approached for participation in the study.

Data were collected using a well-structured, self-administered, and validated questionnaire. The questionnaire comprised five sections. Section A covered the socio-demographic characteristics of the respondents (gender, age group, years of experience, department, level of education, and rank). Section B assessed the prevalence of work-related lower back pain among nurses (items on occurrence, duration, and frequency of lower back pain). Section C assessed the perceived determinants of work-related lower back pain (items on work-related factors such as patient handling, prolonged standing, awkward postures, and individual factors such as age, gender, and body mass index). Section D assessed the effects of work-related lower back pain on job performance (items on physical, psychological, and social effects). Section E assessed the relationship between work environment factors and the occurrence of work-related lower back pain (items on patient-to-nurse ratio, workload, shift length, and equipment availability). The questionnaire items were developed through a literature review and adapted from previous studies on work-related lower back pain among nurses. Sections B to E used a Likert scale with response options of Strongly Agree, Agree, Disagree, and Strongly Disagree.

The reliability of the instrument was established using the test-retest and split-half methods, both considered pilot study procedures. The test-retest method was used to establish the instrument's stability over time. The questionnaire was administered to a separate sample of 20 nurses working in Rivers State University Teaching Hospital, representing approximately 20% of the intended main study sample. The first administration was conducted during the first week of data collection. After a two-week interval, the same questionnaire was re-administered to the same 20 respondents. The test and retest scores for each section were calculated, and the Pearson Product-Moment Correlation Coefficient (r) was computed. The results showed acceptable reliability coefficients ranging from 0.63 to 0.73 across the four sections, which exceeded the acceptable threshold of 0.60-0.70 for research purposes (Polit & Beck, 2021). All correlation coefficients were statistically significant at $p < 0.05$.

The split-half method was also used to establish the instrument's internal consistency. The questionnaire was administered once to the same 20 nurses, and the items were split into two halves (odd and even items). The scores from the two halves were correlated using the Spearman-Brown prophecy formula. The results showed acceptable internal consistency coefficients, with r values ranging from 0.70 to 0.80. The pilot study found that all 20 respondents reported the questionnaire items were clear and easy to understand. No items were identified as ambiguous or problematic. Respondents considered the average completion time of 12-15 minutes acceptable. The response rate for both test and retest administrations was 100%. No major modifications were made to the questionnaire based on the pilot study findings; only minor grammatical corrections were implemented.

Data were collected using a self-administered questionnaire. The researchers distributed the questionnaire to the 158 selected nurses in their respective wards and units within the hospital. The researchers visited the wards and units during the morning and afternoon shifts to distribute the questionnaires. The researchers explained the study purpose to each respondent and obtained informed consent. Respondents were assured that their responses would be kept confidential and were informed that participation was voluntary. The questionnaires were collected from the respondents after completion, either immediately or within 24 hours. The data collection process was conducted over a period of four weeks, from June to July 2023.

Method of Data Analysis

Data collected from the study were analyzed using both descriptive and inferential statistics. The Statistical Package for Social Sciences (SPSS) version 25.0 was used for data analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the socio-demographic characteristics of the respondents and to answer the research questions. The research hypothesis was tested using the Chi-square test at a 0.05 level of significance.

Ethical Considerations

The following ethical considerations were observed throughout the study:

1. **Informed Consent:** All respondents were informed about the purpose of the study and that participation was voluntary. All respondents provided written informed consent before participating in the study.
2. **Confidentiality:** Respondents were assured that their responses would remain confidential. The questionnaires collected no names or identifying information, and the researchers kept the data in a secure location accessible only to them.
3. **Right to Withdraw:** Respondents were informed that they could withdraw from the study at any time without any consequences for their employment or professional standing.
4. **Institutional Approval:** Permission was obtained from the hospital management before data collection commenced. The researchers submitted a letter of introduction to the Medical Director of Rivers State University Teaching Hospital, requesting permission to conduct the study.
5. **Beneficence and Non-maleficence:** The study was designed to minimize any potential harm to respondents. The questionnaire was reviewed to ensure it contained no distressing content, and respondents were provided with contact information for any concerns or questions about the study.
6. **Respect for Persons:** The researchers treated all respondents with respect and dignity, recognising their autonomy and right to make their own decisions about participation in the study.
7. **Justice:** The selection of respondents was fair and non-discriminatory, with all nurses in the hospital having an equal chance of being selected for the study.

Results

Table 1a: Prevalence of Work-Related Lower Back Pain Among Nurses (N=150)

Item	Frequency (f)	Percentage (%)
Have you ever experienced work-related lower back pain?		
Yes	124	82.7
No	26	17.3
If yes, when did you first experience the pain? (n=124)		
Within the last 1 month	20	16.1
Within the last 3 months	32	25.8
Within the last 6 months	28	22.6
Within the last 1 year	24	19.4
More than 1 year ago	20	16.1
Have you sought medical attention for the pain? (n=124)		
Yes	45	36.3
No	79	63.7

The data in Table 1a show that the majority of respondents, 124 (82.7%), reported having experienced work-related lower back pain, while 26 (17.3%) reported never having experienced the condition. Among those who had experienced lower back pain, the highest proportion, 32 (25.8%) first experienced the pain within the last 3 months, followed by 28 (22.6%) within the last 6 months, 24 (19.4%) within the last 1 year, 20 (16.1%) within the last 1 month, and 20 (16.1%) more than 1 year ago. Regarding medical attention, the majority of those who had experienced lower back pain, 79 (63.7%), had not sought medical attention for the pain, while 45 (36.3%) had sought medical attention. The prevalence rate of 82.7% indicates that work-related lower back pain is highly prevalent among nurses in Rivers State University Teaching Hospital, Port Harcourt. This finding is consistent with previous studies on work-related lower back pain among nurses in Nigeria and other settings.

Table 1b: Duration of Lower Back Pain Experienced by Nurses (n=124)

Item	Frequency (f)	Percentage (%)
How long does the pain typically last?		
Less than 1 week	18	14.5
1-4 weeks	32	25.8
1-3 months	28	22.6
3-6 months	20	16.1
More than 6 months	26	21.0
How often do you experience the pain?		
Rarely (once a month or less)	15	12.1
Occasionally (2-4 times a month)	28	22.6
Frequently (once a week)	32	25.8
Very frequently (several times a week)	35	28.2
Daily	14	11.3

The data in Table 1b show that among those who had experienced lower back pain, the pain typically lasted for 1-4 weeks for the highest proportion of respondents 32 (25.8%), followed by 1-3 months for 28 (22.6%), more than 6 months for 26 (21.0%), 3-6 months for 20 (16.1%), and less than 1 week for 18 (14.5%). Regarding the frequency of pain, the highest proportion of respondents 35 (28.2%) experienced the pain very frequently (several times a week), followed by 32 (25.8%) frequently (once a week), 28 (22.6%) occasionally (2-4 times a month), 15 (12.1%) rarely (once a month or less), and 14 (11.3%) daily.

Table 1c: Frequency of Lower Back Pain Episodes (n=124)

Items	Frequency (f)	Percentage (%)
Does the pain interfere with your daily activities?		
Yes	89	71.8
No	35	28.2
Does the pain interfere with your work performance?		
Yes	96	77.4
No	28	22.6
Have you had to take time off work due to the pain?		
Yes	52	41.9
No	72	58.1

The data in Table 1c show that among those who had experienced lower back pain, 89 (71.8%) reported that the pain interferes with their daily activities, while 35 (28.2%) reported that it does not. Furthermore, 96 (77.4%) reported that the pain interferes with their work performance, while 28 (22.6%) reported that it does not. Additionally, 52 (41.9%) reported having had to take time off work due to the pain, while 72 (58.1%) reported that they had not. These findings indicate that work-related lower back pain is not only highly prevalent among nurses but also significantly affects their daily activities, work performance, and leads to absenteeism. The high proportion of nurses who have taken time off work due to the pain (41.9%) underscores the economic implications of the condition for both the individual nurses and the healthcare organization.

Table 2: Perceived Determinants of Work-Related Lower Back Pain (N=150)

Items	SA n(%)	A n(%)	D n(%)	SD n(%)	Mean	SD
Work-Related Factors						
Prolonged standing during the shift contributes to lower back pain	85 (56.7)	50 (33.3)	10 (6.7)	5 (3.3)	3.43	0.78
Manual transfer of heavy patients increases the risk of lower back pain	78 (52.0)	55 (36.7)	10 (6.7)	7 (4.7)	3.36	0.82
Repetitive bending and twisting movements lead to lower back pain	72 (48.0)	52 (34.7)	18 (12.0)	8 (5.3)	3.25	0.86
Heavy workload contributes to the occurrence of lower back pain	70 (46.7)	58 (38.7)	15 (10.0)	7 (4.7)	3.27	0.82
Long working shifts increase the likelihood of experiencing lower back pain	65 (43.3)	62 (41.3)	15 (10.0)	8 (5.3)	3.22	0.84
High patient-to-nurse ratio increases the risk of lower back pain	62 (41.3)	58 (38.7)	22 (14.7)	8 (5.3)	3.16	0.86
Manual handling of heavy equipment increases the risk of lower back injury	60 (40.0)	62 (41.3)	20 (13.3)	8 (5.3)	3.16	0.85
Inadequate staffing increases workload and risk of lower back pain	58 (38.7)	60 (40.0)	22 (14.7)	10 (6.7)	3.10	0.88
Lack of mechanical lifting devices increases the risk of lower back pain	55 (36.7)	58 (38.7)	25 (16.7)	12 (8.0)	3.04	0.91
Poor ergonomic furniture contributes to lower back pain	52 (34.7)	55 (36.7)	28 (18.7)	15 (10.0)	2.96	0.96
Individual Factors						
Increasing age is a risk factor for lower back pain	50 (33.3)	52 (34.7)	30 (20.0)	18 (12.0)	2.89	1.00
Female gender increases the risk of lower back pain	42 (28.0)	48 (32.0)	35 (23.3)	25 (16.7)	2.71	1.06
High body mass index increases the risk of lower back pain	40 (26.7)	50 (33.3)	35 (23.3)	25 (16.7)	2.70	1.05
Smoking increases the risk of lower back pain	32 (21.3)	40 (26.7)	45 (30.0)	33 (22.0)	2.47	1.08

SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

The data in Table 2 show that the highest perceived work-related determinant of lower back pain among nurses was prolonged standing during the shift, with 135 (90.0%) of respondents agreeing or strongly agreeing that it contributes to lower back pain (mean = 3.43, SD = 0.78). This was followed by manual transfer of heavy patients, with 133 (88.7%) agreeing or strongly agreeing that it increases the risk of lower back pain (mean = 3.36, SD = 0.82). Repetitive bending and twisting movements were identified by 124 (82.7%) of respondents as contributing to lower back pain (mean = 3.25, SD = 0.86). Heavy workload was identified by 128 (85.4%) of respondents as contributing to the occurrence of lower back pain (mean = 3.27, SD = 0.82). Long working shifts were identified by 127 (84.7%) of respondents as increasing the likelihood of experiencing lower back pain (mean = 3.22, SD = 0.84). A high patient-to-nurse ratio was identified by 120 (80.0%) of respondents as increasing the risk of lower back pain (mean = 3.16, SD = 0.86). Manual handling of heavy equipment was identified by 122 (81.3%) of respondents as increasing the risk of lower back injury (mean = 3.16, SD = 0.85). Inadequate staffing was identified by 118 (78.7%) of respondents as increasing workload and risk of lower back pain (mean = 3.10, SD = 0.88). Lack of mechanical lifting devices was identified by 113 (75.4%) of respondents as increasing the risk of lower back pain (mean = 3.04, SD = 0.91). Poor ergonomic furniture was identified by 107 (71.4%) of respondents as contributing to lower back pain (mean = 2.96, SD = 0.96). Regarding individual factors, increasing age was identified by 102 (68.0%) of respondents as a risk factor for lower back pain (mean = 2.89, SD = 1.00). Female gender was identified by 90 (60.0%) of respondents as increasing the risk of lower back pain (mean = 2.71, SD = 1.06). High body mass index was identified by 90 (60.0%) of respondents as increasing the risk of lower back pain (mean = 2.70, SD = 1.05). Smoking was identified by 72 (48.0%) of respondents as increasing the risk of lower back pain (mean = 2.47, SD = 1.08). These findings indicate that work-related factors are perceived as more significant determinants of lower back pain among nurses than individual factors. Among the work-related factors, prolonged standing, manual patient handling, and heavy workload were perceived as the most significant determinants. Among the individual factors, increasing age was perceived as the most significant determinant, followed by gender and body mass index.

Table 3: Effects of Work-Related Lower Back Pain on Job Performance (N=150)

Items	SA n(%)	A n(%)	D n(%)	SD n(%)	Mean	SD
Physical Effects						
Work-related lower back pain reduces my strength at work	72 (48.0)	45 (30.0)	22 (14.7)	11 (7.3)	3.19	0.93
Lower back pain limits my ability to perform nursing procedures effectively	68 (45.3)	48 (32.0)	22 (14.7)	12 (8.0)	3.15	0.95
Lower back pain makes it difficult for me to stand for long periods	65 (43.3)	50 (33.3)	22 (14.7)	13 (8.7)	3.11	0.96
Lower back pain affects my ability to lift and transfer patients	62 (41.3)	48 (32.0)	25 (16.7)	15 (10.0)	3.05	0.99
Psychological Effects						
I have difficulty completing tasks on time due to lower back pain	58 (38.7)	50 (33.3)	28 (18.7)	14 (9.3)	3.01	0.96
Lower back pain reduces my job satisfaction	55 (36.7)	48 (32.0)	30 (20.0)	17 (11.3)	2.94	1.00
I consider leaving my job due to lower back pain	45 (30.0)	42 (28.0)	38 (25.3)	25 (16.7)	2.71	1.07
Lower back pain makes me feel depressed or anxious at work	42 (28.0)	40 (26.7)	40 (26.7)	28 (18.7)	2.64	1.09
Social Effects						
Lower back pain affects my interaction with colleagues	38 (25.3)	40 (26.7)	42 (28.0)	30 (20.0)	2.57	1.09
Lower back pain limits my participation in social activities	35 (23.3)	38 (25.3)	42 (28.0)	35 (23.3)	2.49	1.12

SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

The data in Table 3 show that among the physical effects of work-related lower back pain on job performance, the highest proportion of respondents 117 (78.0%) agreed or strongly agreed that lower back pain reduces their strength at work (mean = 3.19, SD = 0.93). This was followed by 116 (77.3%) who agreed or strongly agreed that lower back pain limits their ability to perform nursing procedures effectively (mean = 3.15, SD = 0.95), 115 (76.7%) who agreed or strongly agreed that lower back pain makes it difficult for them to stand for long periods (mean = 3.11, SD = 0.96), and 110 (73.3%) who agreed or strongly agreed that lower back pain affects their ability to lift and transfer patients (mean = 3.05, SD = 0.99). Regarding psychological effects, 108 (72.0%) of respondents agreed or strongly agreed that they have difficulty completing tasks on time due to lower back pain (mean = 3.01, SD = 0.96). Furthermore, 103 (68.7%) agreed or strongly agreed that lower back pain reduces their job satisfaction (mean = 2.94, SD = 1.00). Additionally, 87 (58.0%) agreed or strongly agreed that they consider leaving their job due to lower back pain (mean = 2.71, SD = 1.07), and 82 (54.7%) agreed or strongly agreed that lower back pain makes them feel depressed or anxious at work (mean = 2.64, SD = 1.09). Regarding social effects, 78 (52.0%) of respondents agreed or strongly agreed that lower back pain affects their interaction with colleagues (mean = 2.57, SD = 1.09), and 73 (48.7%) agreed or strongly agreed that lower back pain limits their participation in social activities (mean = 2.49, SD = 1.12). These findings indicate that work-related lower back pain has significant negative effects on nurses' job performance across physical, psychological, and social domains. The physical effects were perceived as the most significant, followed by psychological effects, and then social effects. The high proportion of nurses who reported considering leaving their job due to lower back pain (58.0%) underscores the serious implications of the condition for the retention of nursing staff.

Test of Hypothesis

Table 4: Chi-Square Test of Relationship Between Work Environment Factors and Lower Back Pain.

Work Environment Factor	χ^2	df	p-value	Decision
Patient-to-nurse ratio	12.45	3	0.006	Significant
Workload	15.78	3	0.001	Significant
Shift length	11.23	3	0.011	Significant
Staffing levels	14.56	3	0.002	Significant
Availability of lifting devices	9.87	3	0.020	Significant
Ergonomic furniture	8.45	3	0.037	Significant

The data in Table 4 show that there was a statistically significant relationship between all work environment factors and the occurrence of lower back pain among nurses. The Chi-square values were 12.45 for patient-to-nurse ratio ($p = 0.006$), 15.78 for workload ($p = 0.001$), 11.23 for shift length ($p = 0.011$), 14.56 for staffing levels ($p = 0.002$), 9.87 for availability of lifting devices ($p = 0.020$), and 8.45 for ergonomic furniture ($p = 0.037$). Since all p-values were less than 0.05, the null hypothesis was rejected for all work environment factors. Therefore, it was concluded that there is a significant relationship between work environment factors and the occurrence of work-related lower back pain among nurses in Rivers State University Teaching Hospital, Port Harcourt.

Discussion

Prevalence of Work-Related Lower Back Pain Among Nurses

The study found a high prevalence of work-related lower back pain among nurses, with 82.7% of respondents reporting having experienced the condition. This finding is consistent with previous studies on work-related lower back pain among nurses in Nigeria. Farooq et al. (2015) reported a cumulative point-prevalence of 82.7% among nurses in Ahmadu Bello University Teaching Hospital, Shika-Zaria. Similarly, Osunde et al. (2023) found that 61.15% of nurses in University of Benin Teaching Hospital experienced work-related lower back pain. The high prevalence rate found in this study is also consistent with the findings of Kasa et al. (2020), who reported prevalence rates ranging from 44.1% to 82.7% among nurses in African clinical settings, with a pooled prevalence of 65.2%. The high prevalence of work-related lower back pain among nurses is concerning and highlights the significant occupational health burden faced by the nursing profession. The physical demands of nursing work, including patient handling, prolonged standing, and awkward postures, contribute to this high prevalence. The finding that a significant proportion of nurses (63.7%) had not sought medical attention for their pain is also concerning and consistent with the observation that nurses often ignore issues concerning their own health (Ike & Olawumi, 2018). This tendency to ignore symptoms and continue working contributes to the chronicity of the condition and the development of complications. The study also found that a significant proportion of nurses experienced frequent and prolonged episodes of lower back pain. The majority of respondents (55.0%) experienced pain for 1-4 weeks or longer, and 39.5% experienced pain very frequently or daily. These findings indicate that work-related lower back pain is not just a transient condition but a persistent problem that affects nurses on an ongoing basis. Furthermore, the finding that 77.4% of respondents reported that the pain interferes with their work performance and 41.9% had to take time off work due to the pain underscores the significant impact of the condition on the nursing workforce and healthcare delivery.

Perceived Determinants of Work-Related Lower Back Pain Among Nurses

The study identified multiple perceived determinants of work-related lower back pain among nurses, with work-related factors perceived as more significant than individual factors. Among the work-related factors, prolonged standing during the shift was perceived as the most significant determinant, with 90.0% of respondents agreeing or strongly agreeing that it contributes to lower back pain. This is consistent with the findings of Farooq et al. (2015), who found that standing on duty was a significant risk factor for lower back pain among nurses (88.9%). Similarly, Osunde et al. (2023) found that prolonged standing during nursing care was a major factor for lower back pain among nurses (OR 0.73, $p = 0.003$). Manual transfer of heavy patients was the second most significant work-related determinant, with 88.7% of respondents agreeing or strongly agreeing that it increases the risk of lower back pain. This is consistent with the findings of Farooq et al. (2015), who found that lifting of patients or objects was the highest risk factor for lower back pain among nurses (90%). Similarly, Osunde et al. (2023) found that heavy manual lifting was a major factor for lower back pain among nurses (OR 0.21, $p < 0.001$). The high proportion of nurses who perceived manual patient handling as a significant determinant underscores the need for interventions to reduce the

physical demands of patient handling, such as the provision of mechanical lifting devices and training on proper body mechanics.

Repetitive bending and twisting movements, heavy workload, long working shifts, high patient-to-nurse ratio, and manual handling of heavy equipment were also identified as significant work-related determinants of lower back pain by the majority of respondents. These findings are consistent with previous studies that have identified work-related factors as significant determinants of lower back pain among nurses (Oyediran et al., 2022; Jacquier-Bret & Gorce, 2025; Davis & Kotowski, 2015). The identification of heavy workload and long working shifts as significant determinants highlights the importance of addressing work organization factors in preventing work-related lower back pain among nurses. Inadequate staffing, lack of mechanical lifting devices, and poor ergonomic furniture were also identified as significant work-related determinants by the majority of respondents. These findings highlight the importance of organizational factors in the development of work-related lower back pain among nurses. Healthcare organizations need to ensure adequate staffing levels, provide mechanical lifting devices and ergonomic equipment, and create a work environment that supports safe patient handling practices. Among the individual factors, increasing age was perceived as the most significant determinant of lower back pain, with 68.0% of respondents agreeing or strongly agreeing that it increases the risk. This is consistent with previous studies that have found a significant association between advancing age and lower back pain among nurses (Oyediran et al., 2022; Nottidge et al., 2019). Female gender and high body mass index were also identified as significant determinants by 60.0% of respondents each, which is consistent with previous studies (Awosan et al., 2017; Mijena et al., 2020). Smoking was identified as a significant determinant by 48.0% of respondents, which is consistent with the findings of some studies (Davis & Kotowski, 2015).

Effects of Work-Related Lower Back Pain on Job Performance

The study found that work-related lower back pain has significant negative effects on nurses' job performance across physical, psychological, and social domains. Among the physical effects, the highest proportion of respondents (78.0%) agreed or strongly agreed that lower back pain reduces their strength at work. This was followed by 77.3% who agreed that lower back pain limits their ability to perform nursing procedures effectively, 76.7% who agreed that it makes it difficult to stand for long periods, and 73.3% who agreed that it affects their ability to lift and transfer patients. These findings are consistent with the observations of Ijabadeniyi and Fasae (2023) and Tariq et al. (2023) that work-related lower back pain has significant physical effects on nurses, including pain, disability, and reduced mobility.

Regarding psychological effects, 72.0% of respondents agreed or strongly agreed that they have difficulty completing tasks on time due to lower back pain. Furthermore, 68.7% agreed that lower back pain reduces their job satisfaction, 58.0% agreed that they consider leaving their job due to lower back pain, and 54.7% agreed that it makes them feel depressed or anxious at work. These findings are consistent with the observations of Ijabadeniyi and Fasae (2023) that work-related lower back pain has significant negative psychological effects on nurses, including low self-esteem, depression, and consideration to quit the job or leave the profession. The high proportion of nurses who consider leaving their job due to lower back pain (58.0%) underscores the serious implications of the condition for the retention of nursing staff and the sustainability of the healthcare workforce. Regarding social effects, 52.0% of respondents agreed or strongly agreed that lower back pain affects their interaction with colleagues, and 48.7% agreed that it limits their participation in social activities. These findings are consistent with the observations of Tariq et al. (2023) that lower back pain has significant social effects on nurses, including reduced social interaction and participation in activities of daily living.

Relationship Between Work Environment and Lower Back Pain

The study found a significant relationship between work environment factors and the occurrence of work-related lower back pain among nurses. The Chi-square test revealed statistically significant relationships between all work environment factors (patient-to-nurse ratio, workload, shift length, staffing levels, availability of lifting devices, and ergonomic furniture) and the occurrence of lower back pain among nurses. These findings are consistent with previous studies that have found a significant association between work environment factors and lower back pain among nurses (Osunde et al., 2023; Oyediran et al., 2022; Jacquier-Bret & Gorce, 2025). The significant relationships highlight the importance of addressing work environment factors in the prevention and management of work-related lower back pain among nurses. The finding that heavy workload had the strongest relationship with lower back pain ($\chi^2 = 15.78$,

$p = 0.001$) highlights the importance of workload management in preventing work-related lower back pain among nurses. Adequate staffing levels are essential to ensure that nurses are not overburdened with excessive physical demands. The significant relationship between long working shifts and lower back pain ($\chi^2 = 11.23$, $p = 0.011$) underscores the need for reasonable shift lengths and adequate rest breaks to allow nurses to recover from physical strain. The significant relationship between the availability of mechanical lifting devices and lower back pain ($\chi^2 = 9.87$, $p = 0.020$) highlights the importance of providing equipment to reduce the physical demands of patient handling. Similarly, the significant relationship between ergonomic furniture and lower back pain ($\chi^2 = 8.45$, $p = 0.037$) underscores the need for well-designed workstations and furniture that support proper body mechanics.

Conclusion

The findings indicated that work-related lower back pain is highly prevalent among nurses in Rivers State University Teaching Hospital, Port Harcourt, with a prevalence rate of 82.7%. The condition is not just a transient problem but a persistent issue that affects nurses on an ongoing basis, with significant proportions experiencing frequent and prolonged episodes of pain. The perceived determinants of work-related lower back pain among nurses are multifactorial, with work-related factors perceived as more significant than individual factors. Prolonged standing, manual patient handling, heavy workload, long working shifts, and high patient-to-nurse ratio are among the most significant work-related determinants. Increasing age is the most significant individual determinant, followed by female gender and high body mass index.

Work-related lower back pain has significant negative effects on nurses' job performance across physical, psychological, and social domains. The condition reduces nurses' strength, limits their ability to perform nursing procedures effectively, makes it difficult to stand for long periods, and affects their ability to lift and transfer patients. It also leads to difficulty completing tasks on time, reduced job satisfaction, consideration of leaving the job, and feelings of depression or anxiety at work. There is a significant relationship between work environment factors and the occurrence of work-related lower back pain among nurses. Heavy workload, inadequate staffing, long working shifts, high patient-to-nurse ratio, lack of mechanical lifting devices, and poor ergonomic furniture are all significantly associated with the occurrence of lower back pain. The theoretical framework of Cooper and Marshall's (1976) Work-Related Stress Model is applicable to understanding work-related lower back pain among nurses. The model explains how work-related stressors (such as physical demands, workload, and organizational factors) interact with individual characteristics (such as age, gender, and body mass index) to produce symptoms of occupational illness (such as muscle spasms and pain), which can progress to chronic disease (lower back pain) if not addressed. The findings of this study have significant implications for nursing practice, education, research, and policy. Interventions are needed to prevent and manage work-related lower back pain among nurses, including ergonomic interventions, training on proper body mechanics, adequate staffing, provision of mechanical lifting devices, and occupational health services.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Nurses should be encouraged to practice proper body mechanics, use mechanical lifting devices when available, take regular breaks to rest and stretch, and seek early medical attention when experiencing symptoms of lower back pain. Nurses should also engage in regular exercise to strengthen core and back muscles and maintain a healthy weight.
2. Hospital management should implement safe patient handling programs that include the provision of mechanical lifting devices, training on proper body mechanics, and policies that mandate the use of safe patient handling techniques. Adequate staffing levels should be maintained to reduce workload and physical demands on individual nurses. Reasonable shift lengths and adequate rest breaks should be ensured to allow nurses to recover from physical strain. Occupational health services should be available to provide health surveillance, early detection and treatment of work-related musculoskeletal disorders, and rehabilitation and return-to-work programs.
3. Nursing education curricula should include comprehensive content on occupational health and safety, including the risk factors for work-related lower back pain, proper body mechanics, safe patient handling techniques, and the use of mechanical lifting devices. Continuing education programs should be provided for practicing nurses to reinforce these skills and update their knowledge on evidence-based interventions for preventing work-related lower back pain.

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