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(RESEARCH ARTICLE)

Prevalence and risk factors of low back pain among orthopedic patients in university of Port Harcourt teaching hospital, rivers state, Nigeria

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Abstract

Low Back Pain (LBP) is known as the most common musculoskeletal disorder affecting the general population with a high incidence rate among the active population. It has also been recognized as one of the major causes of decreased efficiency and well-being in the working populace, with the consequent financial, medical, and socioeconomic implications affecting individuals, employers, organizations and the society at large. Low Back Pain has been reported most extensively among all occupational musculoskeletal disorders identified in literature. This study investigates the prevalence, risk factors, and gender-based differences in LBP among patients in the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Nigeria. The study utilized a cross-sectional design with a sample size of 384 male and female patients. Participants were selected through simple random sampling and met the inclusion criteria of being 18 years and above, excluding those with congenital spinal deformities or severe illness. Data was collected using structured questionnaires segmented into three parts. The prevalence of LBP was found to be 62%, with higher rates among males (75.6%) than females (56%). Key risk factors identified included overweight/obesity (OR = 6.094), prolonged standing (OR =3.334), and frequent heavy lifting (OR = 5.200). The study also highlighted gender differences in the adoption of preventive measures, with females more likely to engage in behaviors such as maintaining good posture and avoiding heavy lifting thereby reflecting the societal norm where women are more likely to engage in health seeking behaviors. Ethical clearance certificate was obtained from the appropriate authorities.

Keywords: Musculoskeletal disorder; Prevalence; Orthopedic; Low back pain; Risk factors

1. Introduction

A significant global public health issue that affects people of all ages, professions, and socioeconomic backgrounds is low back pain (LBP). [1]. And also, LBP is a prevalent musculoskeletal disease, with up to 84% of individuals suffering it at least once in their lives. Low back pain has become a key cause of disability and work absenteeism worldwide, resulting to significant economic challenges and lower productivity [2] A higher percentage of LBP is associated with the prolonged or recurrent uncomfortable postures that workers in these occupations frequently adopt. [3]. The consequences of LBP extend beyond mere physical discomfort, impacting the spine with sensations of fatigue and muscle stiffness [4], thereby presenting a substantial public health concern with significant economic implications for the nation, families, and individuals. Global estimates suggest that LBP affects a considerable portion of the population, with an annual incidence reaching 65%, impacting approximately 84% of individuals at some point in their lives [5]. However, Occupational Pain in the low back is categorized as either particular or nonspecific based on its etiology, with nonspecific cases representing the majority. Duration-wise, LBP is acute and can be categorized as (lasting smaller than six weeks), subacute (6 to 12 weeks), or chronic (exceeding 12 weeks) [6]. Individual traits, ward static and dynamic

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working postures, intense physical labor, manual handling and lifting, lifestyle variables, and psychological issues are some of the contributing factors to work-related LBP

2. Materials and methods

2.1. Study area

The investigation work was carried out in the orthopedic department of the University of Port-Harcourt Teaching Hospital (UPTH), Nigeria's Rivers State, Port Harcourt. UPTH is a third-level institution found in April 1980. The majority of patients visiting UPTH Orthopedic unit rarest saw initially at the Orthopedic Clinic, which acts as a secondary care clinic within a tertiary hospital setting.

2.2. Population under Study

The populace was made of 384 Orthopedic individuals whose back pain was not as a result of accident or fracture present at the Orthopedic Clinic (UPTH) during the period of the study.

2.3. Study design

A cross-sectional investigation was adopted to assess the frequency and contributory factors to low back pain among orthopedic patients in Port Harcourt, Rivers State, at the University of Port Harcourt Teaching Hospital, Nigeria. This cross-sectional investigation was conducted between July 15 and November 2020 and all participant's responses were included in the analyses presented in this study.

2.4. Sample Size Estimation/Determination.

The size of the sample of 384 was determined utilizing sample calculation formula known as "Andrew Fisher's Formula", and 10% attrition was considered.

2.5. Aim and Objectives

This research was carried out with the aim of determining the prevalence and Risk factors to Low Back Pain (LBP) between orthopedic patients attending health facility in Rivers State, Nigeria.

The study's goals include

- To determine the prevalence of low back pain between orthopedic patients in Rivers State, Nigeria, at the University of Port Harcourt Teaching Hospital.
- To determine various risk factors to Low Back Pain among orthopedic patients in in Rivers State, Nigeria, at the University of Port Harcourt Teaching Hospital.

2.6. Moral consideration

An ethical clearance certificate approval was acquired from the Ethical Review committee of the Teaching Hospital at the University of Port Harcourt, Port Harcourt, Rivers State, Nigeria. Respondents were assured of Confidentiality and non-maleficence throughout the study as the questionnaire administered didn't reveal any form of personal identity.

2.7. Method of gathering of data.

To gather primary data, a semi-structured self-administered questionnaire was utilized. The questionnaire was structured into (three) parts (Demographics, Prevalence, and Risk factors,) for ease of analysis and on displayed modified using Likert scale of four (4) ranging from strongly Agree to Disagree. The first part of the questionnaire consisted of questions that aimed to obtain sociodemographic information of respondents like Gender, Sex, Age, Income levels, Rank etc. For the purpose of this study, three measuring tools were used in gathering information from participants after obtaining ethical clearance from the necessary authorities.

2.8. Method of data Analysis

A descriptive study of orthopedic patients was conducted at the University of Port Harcourt Teaching Hospital through administered structured questionnaire to evaluate data regarding different measures of low back pain, at the conclusion of each study day, the administered questionnaires were examined, sorted, and serially coded. SPSS® (version 26) was used to enter, clean, and analyze the data. For the respondents' sociodemographic, lifestyle, and health care

consumption patterns, descriptive statistics were used. The p-value of at ≤ 0.05, significance was established. The risk variables for low back pain in orthopedic patients were identified using the logistic regression test.

2.9. Technique of sampling

All the orthopedic Patients who fulfilled the study's requirements were chosen one after the another employing the basic random sampling method

3. Results

The findings revealed a total of 384 participants, including 127 males (33.1%) and 257 females (66.9%) Refer to Figure 4.1. The respondents' age mean ± standard deviation (SD) was 43.9 ± 11.8 years. The Table 4.1 displays The sociodemographic attributes of the participants. Overall most of the attendees were married 272(70.8%) and had attained tertiary education, with 102 females (64.6%) and 35.4% of men. majority either manual laborers or office workers about 26% of the respondents were engaged in other occupations. Most participants earned more than NGN 150,000 monthly, with 129 females (64.8%) in this income bracket compared to 70 males (35.2%). Additionally, the majority of participants, particularly males (66.7%), worked between 20-40 hours per week, whereas females (80.8%) worked fewer than twenty hours. per week. Those who participated resided in both urban and rural settings, with a significant a section of the of the study population having access to healthcare—85 males (34.1%) and 164 females (65.9%). The majority of participants were either overweight (male 21.4% and female 78.5%) or had normal weight (male 34.2% and female 65.8%), or had normal weight (male 34.2% and female 65.8%), with a mean body mass index of 23.5 ± 5.27 kg/m^2.

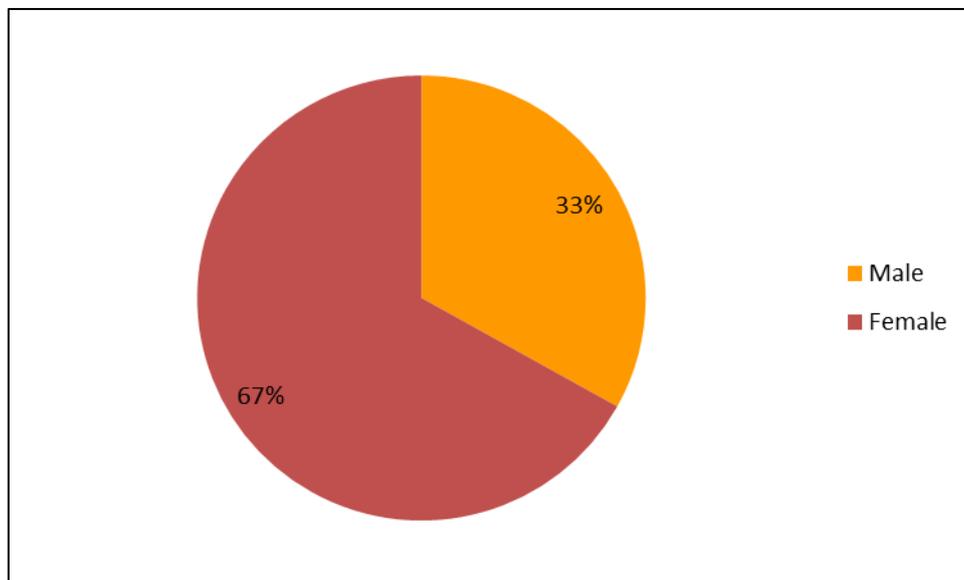**Figure 1** Gender distribution of respondents

Table 1 Respondents' sociodemographic attributes

Various factors	Qualities	Male		Female		Sum	
		n= 127.	%	n= 257.	%	N= 384.	%
Age group	18-24	13	37.1	22	62.9	35	100
	25-34	9	14.5	53	85.5	62	100
	35-44	20	35.1	37	64.9	57	100
	45-54	53	39.6	81	60.4	134	100
	55-64	32	48.5	34	51.5	66	100
	65 and above	-	-	30	100	30	100

Marital status	Single	26	33.3	52	66.7	78	100
	Married	99	36.4	173	63.6	272	100
	Divorced	2	50	2	50	4	100
	Widowed	-	-	30	100	30	100
Occupation	Manual laborer	48	47.5	53	52.5	101	100
	Office worker	46	29.5	110	70.5	156	100
	Healthcare-professional	-	-	47	100	47	100
	Student	20	37	34	63	54	100
	Others	13	50	13	50	26	100
Levelof Education	No formal schooling	2	13.3	13	86.7	15	100
	Elementary schooling	6	33.3	12	66.7	18	100
	Secondary schooling	63	53.8	54	46.2	117	100
	University education	56	35.4	102	64.6	158	100
	Postgraduate-learning	-	-	76	76	76	100
Monthly income range	NGN 50,000 or less	30	53.3	55	64.7	85	100
	NGN 50,000 to 100,000	7	10.3	61	89.7	68	100
	NG100,000 to150,000	20	62.5	12	37.5	32	100
	NGN 150,000 or more	70	35.2	129	64.8	199	100
Place of resident	Urban	98	30.9	220	69.1	318	100
	Rural	29	43.9	37	56.1	66	100
Working hours	Under 20 hours	45	19.2	189	80.8	234	100
	20 to 40 hours	48	66.7	24	33.3	72	100
	40 to 60 hours	30	50	30	50	60	100
	60 hours or more	4	22.2	14	77.8	18	100
Access to healthcare	Yes	85	34.1	164	65.9	249	100
	No	42	31.1	93	68.9	135	100
Body Mass Index	Underweight	20	58.8	14	41.2	34	100
	Normal range	65	34.2	125	65.8	190	100
	Overweight	24	21.4	88	78.6	112	100
	Obese	11	39.3	17	60.7	28	100

The prevalence of low back pain among patients

Of all those who responded,62% reported Having low back pain (LBP), while 38% reported no symptoms of low back pain (Figure 1). displays the distribution of on the prevalence of low back pain among respondents. This indicates that more than half of the study population had suffered from low back pain. Table 4.2 demonstrates the respondents' sociodemographic traits based on the incidence of LBP.

Among male respondents, 75.6% reported experiencing discomfort in the low back, and 24.4% reported no symptoms (Figure 4.3). In contrast, among female respondents, 56% reported experiencing low back pain, while 44% did not report any symptoms. This suggests that low back pain is more prevalent between males than females in this population and statistically significant (χ^2 = 13.874, p = 0.000) as showed in Table 4.2. Table 4.2 showed the prevalence of LPB by sociodemographic factors. As people age, low back pain seems to become more common, peaking between the ages of 45-64 years (69.4% in the 45–54 group and 68.2% in the 55–64 group). Age and the prevalence of LBP did not statistically correlate (χ^2 = 8.500, p = 0.131). Those with only a primary education had a higher prevalence. (83.3%), respondents working 20-40 hours per week (77.8%), normal BMI (72.6%) and Obese (71.4%) and was statistically significant as shown in table 4.2. With respect to occupation, a greater prevalence of low back pain was seen among healthcare practitioners (72.3%), while students had the lowest prevalence (46.3%). The link between profession and low back discomfort is statistically significant (χ^2 = 9.524, p = 0.049) which suggests that occupation plays a role in the

frequency of low back pain. Among those who said yes to LBP, only 1.6% specified their state of low back pain, which included Arthritis, back pain, muscle spasms, rheumatoid arthritis, and spinal (lumbar).

Among respondents who have experienced low back pain, the highest proportion (38%) reported experiencing it rarely, while 32% experienced it daily (Figure 4.3). This suggests that while many people experience occasional low back pain, a substantial number deal with daily discomfort, indicating potential chronic pain issues. Most respondents (68.3%) who have reported the intensity of their low back discomfort within the previous 12 months. the pain as moderate, with smaller proportions experiencing either mild (20.8%) or severe (10.8%) pain (Figure 4.4). This highlights that while the pain is manageable for most, a significant portion deals with a considerable level of discomfort.
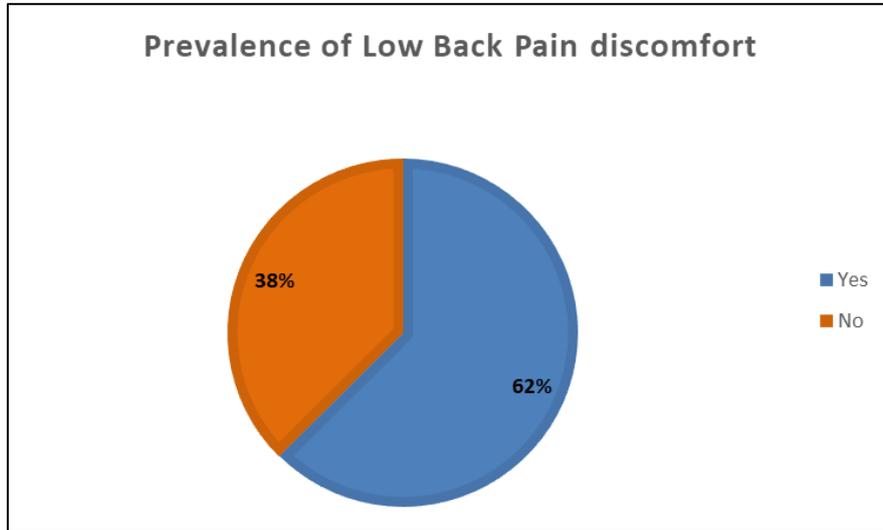

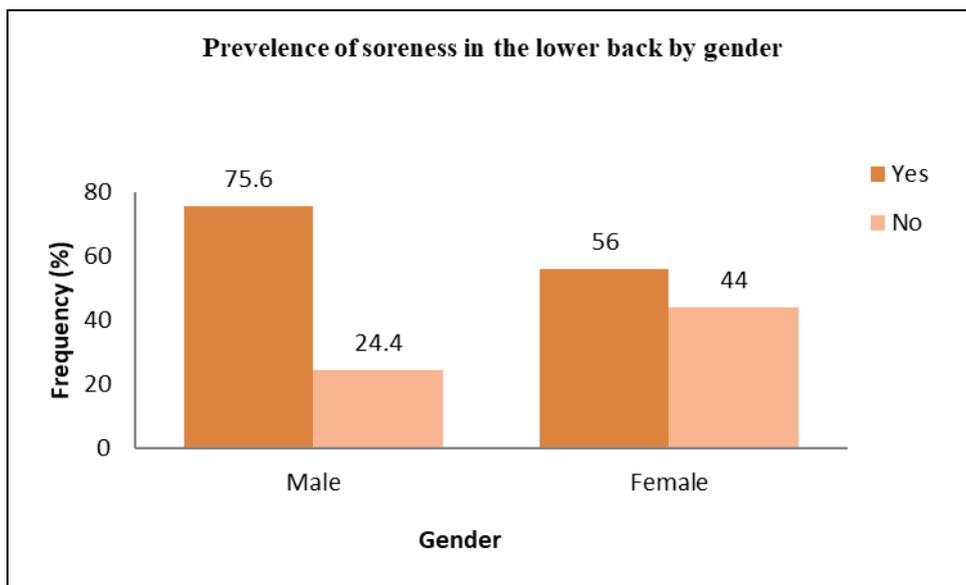**Figure 2** Respondents' prevalence of low back discomfort

Figure 3 Prevalence of low back pain between respondents

Table 2 Respondents' sociodemographic attributes according to the frequency of low back disorders

| Various factors	qualities	LPB		No LPB		Sum		χ^2	df	P
		n= 243	%	n= 141	%	N= 384	%			
Age range	18-24,	18	51.4	17	48.6	35	100	8.500	5	0.131
	25-34,	36	58.1	26	41.9	62	100			
	35-44,	33	57.9	24	42.1	57	100			
	45-54,	93	69.4	41	30.6	134	100			
	55-64,	45	68.2	21	31.8	66	100			
	65,up	15	50	15	50	30	100			
Gender	Male,	96	75.6	31	24.4	243	100	13.874	1	0.000
	Female,	144	56	113	44	141	100			
Marital status	Single,	45	57.7	33	42.3	78	100	7.307	3	0.063
	Married,	180	66.2	89	32.7	272	100			
	Divorced and	2	50	2	50	4	100			
	Widowed	13	43.3	17	56.7	30	100			
Occupation	Hand laborer	65	64.4	36	35.6	101	100	9.524	4	0.049
	Office worker	102	65.4	54	34.6	156	100			
	Healthcare-professional	34	72.3	13	27.7	47	100			
	Student	25	46.3	29	53.7	54	100			
	Others	14	53.8	12	46.2	26	100			
Educational level	No formal schooling	12	80	3	20	15	100	11.727	4	0.020
	Elementary schooling	15	83.3	3	16.7	18	100			
	Secondary schooling	68	58.1	49	41.9	117	100			
	University education	106	67.1	52	32.9	158	100			
	Postgraduate-learning	39	51.3	37	48.7	76	100			
Working hours	Under 20 hours	139	59.4	95	40.6	234	100	14.822	3	0.002
	20 to40 hours	56	77.8	16	22.2	72	100			
	40 to60 hours	39	65	21	35	60	100			
	60 hours or more	6	33.3	12	66.7	18	100			
Body Mass Index	Underweight	16	47.1	18	52.9	34	100	27.555	3	0.000
	Normal range	138	72.6	52	27.4	190	100			
	Overweight	50	44.6	62	55.4	112	100			
	Obese	20	71.4	8	28.6	28	100			
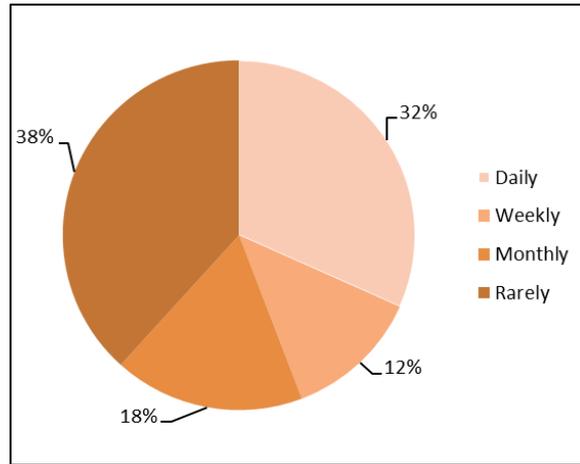
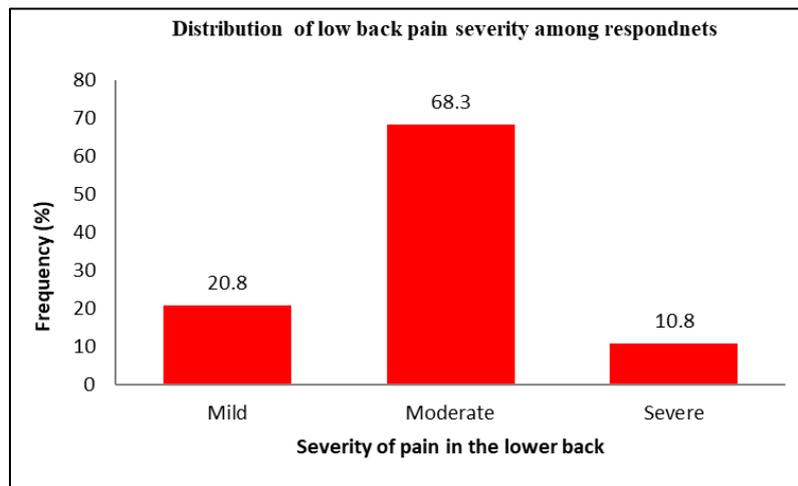**Figure 4** Low back pain frequency

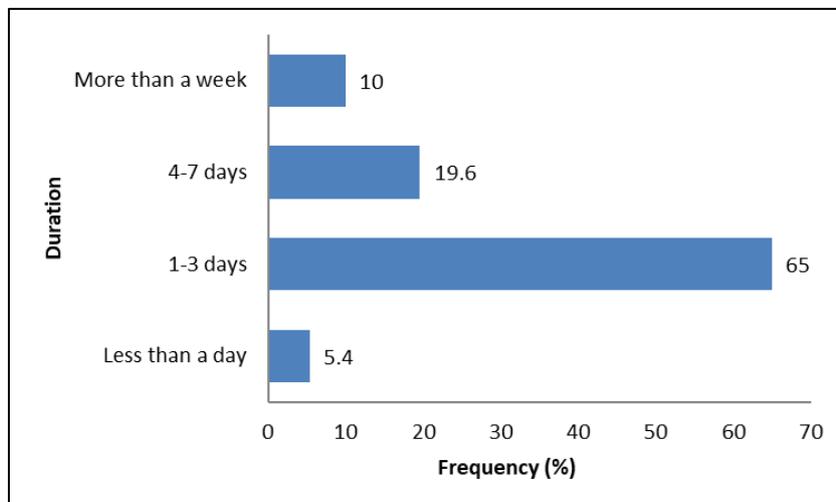**Figure 5** Low back pain severity among respondents

Figure 6 Frequency (%)

Risk factors for orthopedic patients at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria, who suffer from low back pain (LPB)

Logistic regression test had been used to determine the risk variables linked to respondents' low back discomfort along with included only variables that showed significant association. The logistic regression is displayed in Table 4.4. analysis identifying substantial risk factors for low back pain in both males and females. Four variables were found associated to have an important connection with the likelihood of having pain in the lower back.

Overweight/obesity emerged as the biggest predictor of low back discomfort, with an odds ratio (OR) of 6.094 (95% CI: 2.929–12.679, p = 0.000). This indicates that individuals who are overweight or obese were approximately People with low back discomfort are six times more likely to report it than people with normal

Prolonged standing was likewise substantially linked to low back pain (OR = 3.334, 95% CI: 1.333–8.340, p = 0.010), suggesting that participants who engage in prolonged standing have over three times the odds of experiencing pain at the lower back.

Finally, daily lifting of heavy objects was significantly linked to a higher probability of low back discomfort (OR = 5.200, 95% CI: 1.206–22.419, p = 0.027). This suggests that individuals who regularly lift heavy objects are about five times more likely to develop low back discomfort compared to those who do not.

The conclusions indicated that being overweight/obese, prolonged standing, and daily lifting of heavy objects are important risk factors for the respondents' low back pain.

Table 3 Logistic regression of low back pain and important risk factors

Variable	B	Sig.	Odds Ratio Exp. (β)	95.0% C.l. for Exp (β)	
				Lower	Upper
Overweight/Obese	1.807	0.000	6.094	2.929	12.679
Prolong standing	1.204	0.010	3.334	1.333	8.340
Daily lifting of heavy objects	1.649	0.027	5.200	1.206	22.419

4. Discussion

The prevalence of low back pain (LBP) and its risk factors were evaluated in the present study among patients at the University of Port Harcourt Teaching Hospital in Rivers State, Nigeria. The results showed a significant gender difference in the prevalence of LBP and the risk factors associated with it, as well as the importance of lifestyle and occupation factors. The total prevalence of LBP in our study (62%) is consistent with the global trend in developing countries, where a high burden of musculoskeletal disorders is commonly reported. The gender disparity in LBP prevalence observed in this study, where males (75.6%) had a higher prevalence than females (56%), aligns with some studies but contradicts others. For instance, Sikiru and Hanifa [7] found a higher prevalence of LBP among males in a Nigerian population, similar to our findings. However, other studies, such as Stolze et al. [8] and Wu et al. [9], have documented a greater incidence of LBP in women, which is frequently ascribed to physiological and hormonal factors including pregnancy, or societal roles that involve repetitive household tasks. The results from this investigation indicate that in this Nigerian population, occupational factors like manual labor and lifting heavy objects, more commonly associated with males, could explain the higher prevalence of LBP among men.

Age was also identified as a non-significant factor in LBP prevalence in this study ($\chi2$ = 8.500, p = 0.131), which is inconsistent with several studies, such as those by Hoy et al. [10] and Becker et al. [11], which demonstrate that due to degenerative changes in the body, the risk of LBP rises dramatically with age. the spine. The lack of a significant association with age in this study may be attributed to the relatively young average age (43.9 years) among the sample population, which may not have captured the full spectrum of age-related spinal degeneration.

The logistic regression analysis revealed that overweight/obesity, prolonged standing, and heavy lifting were the strongest predictors of LBP. These findings are supported by previous studies such as Zhu et al. [12], which found a strong association between obesity and LBP because of the increased mechanical back strain. In a similar vein, Grøn et al. [13] highlighted prolonged standing and hard lifting as important occupational risk factors for LBP. The strong association between manual labour and LBP in this study is also in line with the work of Frymoyer [14], who identified occupational demands, particularly in jobs requiring repetitive lifting and bending, as significant contributors to LBP.

Interestingly, our study found no significant connection between LBP and factors like a sedentary lifestyle, smoking, and family history of chronic LBP. These results are inconsistent with many studies that have shown a link between sedentary behaviors and the development of LBP. For example, Chen et al. [15] demonstrated that prolonged sitting, especially in bad posture, considerably increases the risk of LBP. The lack of a significant correlation in our study may be due to the relatively low proportion of participants reporting sedentary lifestyles, as most participants were engaged in some form of manual labor.

Gender differences in risk factors were evident, particularly with respect to heavy lifting. A higher proportion of males (20.8%) engaged in heavy lifting compared to females (9%), and this was significantly associated with LBP ($\chi2 = 10.594$, p = 0.005). This supports findings from Hartvigsen et al. [16], which reported that men, especially those involved in physically demanding jobs, are more likely to develop LBP due to occupational factors. On the other hand, females were more likely to report poor posture and ergonomic issues, aligning with findings by Alavi et al. [17], which indicated that women are more prone to LBP due to ergonomic variables in both occupational and residential settings.

5. Conclusion

The findings of this study underscore the high prevalence of low back pain among patients attending the University of Port Harcourt Teaching Hospital, with males reporting a higher prevalence than females. Key risk factors, including overweight/obesity, prolonged standing, and heavy lifting, are strongly associated with LBP. Preventive measures such as ergonomic practices, good posture, and back exercises were more commonly adopted by females. This study highlights the importance of addressing occupational and lifestyle risk factors to reduce LBP among patients.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

If studies involve use of animal/human subject, authors must give appropriate statement of ethical approval. If not applicable then mention 'The present research work does not contain any studies performed on animals/humans subjects by any of the authors'.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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