IBOM MEDICAL JOURNAL
Vol.19 No.3 | July - September 2026 | Pages 702-709
www.ibommedicaljournal.org

Prevalence of low back pain among Church Attendees in a rural community in Southern Nigeria

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Abstract

Background: Low back pain (LBP) is the leading cause of years lived with disability globally, according to the Global Burden of Disease Study 2021. The largest projected increase in LBP cases worldwide over the next 30 years will occur in Africa and Asia, mostly due to aging and population growth. There is a paucity of data on LBP prevalence in low- and middle-income countries, especially from occupationally heterogenous rural settings in Nigeria.
Objective: To determine the prevalence of LBP and its socio-demographic, anthropometric and occupational associations among church attendees in a rural community in South-south Nigeria.
Materials and methods: Consecutive sampling was used to recruit 110 consented adults aged 18 - 79 years at churches into this study. Simple logistic regression was utilized to analyse the association between the variables of gender; age groups; alcohol intake; use of tobacco; exercise; use of a soft mattress; waist:hip ratio, BMI and LBP.
Results: The prevalence of LBP in this study was 88%. Bivariate analysis using simple logistic regression revealed that gender (cOR = 17.85; 95% CI: 2.23 – 142.85; p = 0.007) and exercise (cOR = 0.19; 95% CI: 0.04 – 0.92; p = 0.039) were significantly associated with the prevalence of low back pain. Conversely, no significant association was observed between age (p = 0.718), type of mattress (hard or soft) (p = 0.626), BMI (p = 0.982), waist-to-hip ratio (p = 0.713), alcohol consumption (0.794), tobacco consumption (p = 0.382) and LBP. The predominant socioeconomic class was class 5.
Conclusion: This study provides preliminary evidence that female gender and exercise are major associated factors for LBP in this setting. These findings set the stage for future large scale confirmatory studies in this region.

Key words: low back pain, prevalence, predictors, rural setting, Nigeria.

Introduction

The Global Burden of Disease Study 2021, revealed low back pain (LBP) to be the leading cause of years lived with disability globally.[1] However, in specific regions of Sub-Saharan Africa, this high musculoskeletal burden exists alongside communicable and nutritional conditions, with HIV/AIDS and iron-deficiency anaemia having a large share of the overall disease burden.[1] The number of people living with LBP and its impact on society is expected to rise much more in Africa and Asia over the next 30 years, mostly due to increases in aging and population growth.[1] Other contributory factors include a high proportion of people engaging in physically demanding means of daily living, persistent lower priority given to musculoskeletal conditions compared to infectious and nutritional diseases and an increasing prevalence of non-communicable diseases.[2] In addition, prevention and treatment of musculoskeletal conditions do not receive adequate

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DOI: 10.61386/imj.v19i3.1202

funding in low- and middle-income countries.[2] Some of the risk factors for LBP in the developed countries, such as obesity and smoking, are also increasing in low- and middle-income countries.[2]

The paucity of data on LBP and thus on the development of its major prevention initiatives in low- and middle-income countries, is illustrated by the data abstracted from the GBD study which attributes the lowest DALY's from musculoskeletal conditions to Africa (1.33%).[3] Furthermore, the importance of LBP studies in low- and middle-income countries, is highlighted by the finding that the gross domestic product of a country or region is related to the DALY's.[3] This pinpoints musculoskeletal conditions like LBP as a major hindrance to economic productivity.

LBP is defined as pain in the region between a line across the 12th ribs and the gluteal folds, bad enough to limit the persons usual activities or change the daily routine for more than one day and is often associated with pain extending into one or both gluteal regions and into the ipsilateral lower limb.[4] While LBP is a symptom and not a disease, its cause is usually ill-defined because there is usually no specific nociceptive source and hence it is termed non-specific LBP.[2,5] In this environment, LBP is often referred to as 'waist pain', and the term 'back' is often understood to mean the thoracic region. Thus, physicians in this environment tend to use waist rather than low back in clinical encounters using the English language, in order to get understood by patients.[5]

The experience of LBP in adults is often compounded by comorbidities and has biophysical, social, genetic and psychological correlates and all these negatively impact the ensuing debility.[2] In a study on farmers in a rural community in Nigeria, LBP was noted to be significantly associated with increasing age, male gender and longer years of farming activity.[6] It was also noted to be a significant cause of absenteeism from the work of peasant farming. These findings support the notion that LBP can have major deleterious effects on the livelihoods of people in low- and middle-income countries, where support for disabilities is usually low or absent.[2] While the absence of population level data on LBP from low- and middle-income countries has been noted, the impact of LBP on the survival of families in and the economy of these countries needs to be highlighted to make it a priority for research, prevention, managed care and rehabilitation.[7,8]

There is a paucity of data on LBP prevalence in rural settings that are heterogenous with respect to occupation in Nigeria.[9] This is within a mileau of widely varying socioeconomic and occupational factors, such as heavy agricultural manual labour and domestic work experience. This study was carried out in an occupationally diverse rural community to highlight the prevalence of LBP, identify its associated factors and contribute to the inadequate data on LBP from low- and middle-income countries.

Materials and Methods

Study setting

This study was carried out in the Northern half of Mbioto One village in Etinan local government area of Akwa-Ibom state in the South-south zone of Nigeria. It has a typical village setting with a mixture of both mud and cement houses with fence free designs. The typical occupations of the villagers are farming, farm produce processing, trading and civil service (teaching in adjacent government primary and secondary schools). There are many churches but no mosque. The predominant language spoken is Ibibio, with English (in a pidgin variant), as the alternate language. There is both a community health center and a local patent medicine vendor's shop. Religious services, weddings and burial ceremonies are the main social events that draw community members together.

Sample size determination

In order to estimate the population of the village, since there was no formal record, a desktop survey using Google maps was carried out. The satellite image of the village revealed about 213 houses. With an empirical estimate of 4 adults in each house, some of which were abandoned, the total number of adults was estimated to be 832.

A margin of error of ±7% was chosen as acceptable for this descriptive community-based study. This decision was in line with similar research, such as the study by Bussières et al., which used a 10% margin of error and a 90% confidence interval.[10] We based our expected prevalence of low back pain on a previous similar study by Fabunmi et al., which

reported a LBP prevalence of 72.4%.[6] Using this proportion (p = 0.724), a 95% confidence interval (Z = 1.96), and the desired margin of error of ±7%, the initial sample size calculated with Cochran's formula was 157 participants. Because the total population of the village was small (N = 832), we then applied the finite population correction. This reduced the required sample size to 132 participants.

Sampling technique, study design, study instrument and study protocol

Consecutive sampling was used to recruit participants into this cross-sectional study. The study instrument used was adapted from an instrument used in an urban study on the prevalence of LBP by Nottidge et al.[11] A prominent member of the village hierarchy was briefed about the proposal and his advice was followed in carrying out the study. Permission to carry out the study in each of the four churches was obtained from the clergy. A team of four research assistants were trained on the administration of the questionnaire and measurement of the anthropometric variables. The study was carried out after Church service on Sundays from July to September 2019, by recruiting all consenting adults who attended Church service into the study, except pregnant women and those who had obvious back deformity. A total of 110 respondents were recruited into the study due to logistic and feasibility constraints. This study adhered to the ethical principles of the declaration of Helsinki for research involving human participants. Verbal informed consent was obtained from the group and those who opted to stay after Church for the study, did so. As a give back to the group for their time, a medical outreach was carried out in tandem with the study at each venue, such that people who had LBP and some other complaints such as fever, rashes and other symptoms were given free medications to address those concerns. In addition, they had their blood pressure measured, were informed of the results and counselled appropriately.

Inclusion criteria

All consenting adults who attended Church services on designated Sundays.

Exclusion criteria

Pregnant women

Adults who had obvious back deformity

Results

There were 51 males and 59 females, resulting in a male:female ratio of 1:1.15.

Participants in the 30–49 year and 50–79 year age groups accounted for 40.9% of the respondents. Trading (37.6%) and farming (22.0%) were the top two occupations among the respondents.

The highest level of education attained was primary school education in 45.4% of the respondents.

The monthly income was less than 50,000.00 naira in 88% of the respondents. (Table 1)

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency	Percent
Age group(years)		
25–29	Freq.	%
30–49	20	18.2
50–79	45	40.9
Total	45	40.9
	110	
Occupation		
Trader	41	37.6
Farmer	24	22.0
Nil	12	11.0
Others	10	9.2
Pastor	5	4.6
Driver	4	3.7
Mechanic	3	2.8
Civil Servant	3	2.8
Student	3	2.8
Carpenter	2	1.8
Teacher	2	1.8
	109	
Education		
Primary	49	45.4
Junior Sec	5	4.6
Senior Sec	33	30.6
Tertiary	15	13.9
No education	6	5.6
Total	108	
Income		
<50k	81	88.0
51-100k	7	7.6
151-200k	3	3.3
>200k	1	1.1
Total	92	

(Percentages may not sum to exactly 100% due to rounding)

'Others' includes one each of plumber, welder, hairdresser, traditional birth attendant etc.

Traders includes the selling of goods and services, such as farm produce, clothing items, hair salons, tailors etc and often doing more than one of these.

Medications were not used in the treatment of LBP in 41.7% of the respondents. (Figure 1)

Ninety-seven (88%) of the respondents across all ages had experienced LBP in the last one year. (Table 2)

Bivariate analysis using simple logistic regression revealed that gender (cOR = 17.85; 95% CI: 2.23 – 142.85; p = 0.007) and exercise (cOR = 0.19; 95% CI: 0.04 – 0.92; p = 0.039) were significantly associated with the prevalence of low back pain.

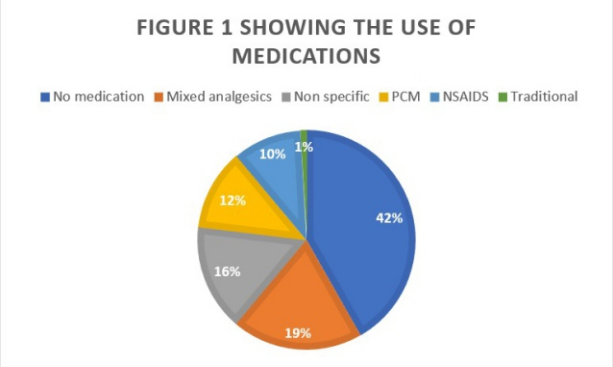

FIGURE 1 showing the use of medications

Table 2: Bivariate analysis of variables with respect to low back pain

Variable	Category	Yes(%)	No(%)	Total N	cOR	95% C.I.	P-value
Gender	Male (Ref)	39(76.5)	12(23.5)	51	1.00	-	-
	Female	58(98.3)	1(1.7)	59	17.85	2.23-142.85	0.007*
	Total	97	13				
Age Group	50-79 Years(Ref)	41(91.0)	4(8.9)	45	1.00	-	0.718
	18-29 Ycars	17(85.0)	3(15.0)	20	0.55	0.11-2.74	0.468
	30-49 Ycars	39(86.7)	6(13.3)	45	0.63	0.17-2.42	0.505
Exercise	No (Ref)	2(4.1)	47(95.9)	49	1.00	-	-
	Yes	50(82.0)	11(18.0)	61	0.19	0.04-0.92	0.039*
Mattress Type	Firm (Ref)	17(85.0)	3(15.0)	20	1.00	-	-
	Soft	80(89.9)	10(11.1)	90	1.41	0.35-5.68	0.627
Alcohol Use	No (Ref)	56(87.5)	8(12.5)	64	1.00	-	-
	Yes	41(89.1)	5(10.9)	46	1.17	0.36-3.84	0.794
BMI	High (>25) (Ref)	37(88.1)	5(11.9) 8(11.8)	42	1.00	-	-
	Low (≤25)	60(88.2)		68	0.97	0.30-3.19	0.961
WHR Risk	Normal (Ref)	43(84.3)	8(15.7)	51	1.00	-	-
	High Risk	54(91.5)	5(8.5)	59	2.01	0.61-6.59	0.249

*statistically significant

Conversely, no significant association was observed between age (p = 0.718), type of mattress (hard or soft) (p = 0.626), BMI (p = 0.982), waist-to-hip ratio (p = 0.713), alcohol consumption (0.794), tobacco consumption (p = 0.382) and LBP. (Table 2)

Discussion

The objective of this study was to determine the prevalence of LBP in a rural population and identify its associated factors. The 12 -month prevalence of low back pain was found to be 88%. The high prevalence of LBP in this cohort (88%) aligns with previous studies that recorded prevalence rates of 72.4% and 74% respectively, both having been carried out in rural farmers and also defining a 12-month prevalence of LBP.[6,12] This high prevalence of LBP is expected to result in increased disability and thus markedly reduce the earning capacity of the families in this cohort. This was noted in the studies by Fabunmi and Tella in which the absence from farm work due to LBP was noted in 34.5% and 57.8% of the respondents, respectively.[6,12] The rural location of the population suggests the use of physical labour as a means of livelihood, which may place significant strain on the low back and account for the unusually high proportion of people with LBP in our cohort. In addition, 12 – month prevalence, which we used, is usually noted to be higher than 4-week prevalence or point prevalence. At present however, expert consortia have recommended the use of 4-week prevalence as the standard for LBP studies.[13]

It has been established that increasing age up to 60 – 65 years is a major risk factor for LBP.[14] The proportion of people in the above 40 years age group is expected to increase in low- and middle-income countries, due to increases in life expectancy and thus predispose to an increase in the prevalence of LBP.[15] Age, however, was not noted to be significantly associated with LBP among our respondents (Table 2). This may be related to the high prevalence of LBP among all the age groups of the cohort, such that age no longer served as a useful discriminator. This is coherent with findings of a study by Johnson but opposed to another study by Nottidge et al, both of which were hospital based.[11,16] A community based study by Kossi et al showed that age was a predictive factor for LBP in rural communities but not in urban communities.[17] It is considered that with increasing age in adults, there is background spine degeneration, compounded by cumulative overuse and misuse of the back, such that in adults, by 80 years of age, the prevalence of LBP has peaked, though the highest number of cases occurs in the 50 – 55 years age group.[18] However,

there is no specific nociceptive cause of the LBP in 90% of cases.[18]

Our study showed that being female was significantly associated with LBP (Table 2). This is coherent with findings from the study by Birabi et al which was also conducted in the South-south of Nigeria.[19] A community-based study by Tella et al carried out in the South-west of the country revealed LBP to be commoner in males.[12] The difference may be related to the practice of women being more involved in manual labour outside the home in the South-south and the converse in the South-west.[19] In addition, women in this environment have three areas of life that put them at an increased risk for LBP – pregnancy (the number of children in rural communities is noted to be high), domestic work experience (the practices of sweeping the floor with a native (short) broom and washing clothes, both with a prolonged bending posture of the low back; cooking native dishes which usually require long standing) and working outside the home (in the South-south of Nigeria, women were noted to do a lot of farming).[20–22] Globally, low back pain is commoner in females but was noted to be commoner in males in Africa.[2,23] However, the systematic review by Morris et al, which noted a higher prevalence in males in Africa, also noted the included studies to have been mostly industry based, which could have skewed the findings towards the male gender, on account of males being overrepresented in the workforce.[23] These findings highlight the need for larger epidemiological surveys to better quantify the burden of LBP and inform targeted interventions in rural communities in this region.

Carrying out exercise was also found to be significantly associated with LBP. The relationship of the prevalence of LBP with exercise is 'U' shaped, with low and high volumes of exercise associated with an increased risk but moderate volumes associated with a reduced risk of severe LBP.[24,25] Exercise strengthens the muscles and ligaments supporting the spine, improving the capacity of the spine to cope with physiologic stress. However, Huo et al also considered that excessive exercise, especially of the loading variety, may be harmful to the spine, while poor exercise habits leave the spine more susceptible to injury.[24] The high prevalence of LBP among women in this study could be linked to their primary involvement in farming activities, which also serves as a form of exercise.[21]

It was noted that 59.6% of this population were either traders (37.6%) or farmers (22%) (Table 1). Trading is often associated with prolonged sitting, which is a major risk factor for LBP.[26] Farmers often use repetitive motions, poor working and lifting postures and frequent lifting of heavy objects, all of which are risk factors for LBP in the literature.[27] Studies on farming communities have noted 12-month prevalence rates of LBP to be 72.4% (South-west Nigeria; n = 500) and 67.1% (South-south Nigeria, n = 310).[6,19] The duration of farming has been associated with a higher prevalence of LBP.[19] Occupation was not analysed for an association with LBP in this study due to the sparse distribution of the various occupations in 41% (n = 45) of the cohort (Table 1). The frequency of each of these heterogenous groups was too low to reliably carry out bivariate analysis. Further studies with larger sample sizes are needed to reliably address the relationship between heterogenous occupations and LBP in a rural community.

It was also noted that 41.7% of the population did not use medications for the alleviation of the LBP (Table 1). This may be related to poor use of health facilities, poor access to health facilities and low income (88% of the population had a monthly income of less that 50,000 Naira (about 139USD at the time of the study in 2019) (Table 1)). The occupations listed, most of which are petty trading and subsistent farming (59.6%), half of whom have attained junior secondary level of education (50%) place the respondents mostly in socioeconomic status (SES) class 5 (the informal sector)(Table 1) according to the revised classification for Nigeria by Ibadin and Akpede.[28] The low income and limited education of SES 5 are related, as the low earnings are derived from the low cadre jobs accessible to those with limited education, and both are risk factors for LBP.[14,29] In the informal sector, there is a preponderance of menial occupations which are associated with LBP due to heavy lifting, use of vibration tools and repetitive motions.[27] In addition, with limited education, the knowledge of modern facilities for care of musculoskeletal disorders may be lacking. Also, with a low income, there would be reduced funds to procure medications. Williams et

al noted an inverse relationship between the prevalence and intensity of LBP and education and wealth, among older adults living in rural areas.[29] They noted this association to be due to the higher likelihood of those in rural areas being involved in heavy lifting. The association of LBP with low socioeconomic class is commonly reported in the literature,[14] but this study did not interrogate this factor due to a preponderance of respondents being in the low SES (88%) (Table 1). Further studies are required on the relationship between socioeconomic status and LBP in rural settings.

In contrast to previous research indicating that soft mattresses are positively associated with LBP, our findings showed no statistically significant relationship with type of mattress ($p = 0.626$).[11,30] From a biomechanical perspective, it is often argued that soft surfaces lack the support necessary to maintain neutral spinal alignment, while hard surfaces provide inadequate load distribution.[30] However, the lack of independent significance for mattress type in this cohort suggests that these sleep-related environmental factors may not be as critical to LBP etiology as gender.

In this study, several factors—including tobacco use, alcohol consumption, and anthropometric measures such as BMI (using a 25kg/m² threshold) and waist-to-hip ratio—did not show a significant association with LBP (Table 2). The lack of independent significance for these variables is consistent with literature featuring limited sample sizes.[16,31] This suggests that a larger, more diverse sample may be required to reveal the more subtle influences of lifestyle and anthropometric factors.[9,11]

Conclusion

This study revealed a high prevalence of LBP among church attendees in a rural occupationally diverse community, with female gender and exercise as the two significantly associated factors. Other lifestyle and anthropometric factors showed no significant association with LBP prevalence.

These results underscore the need for gender-specific ergonomic interventions within the domestic and occupational sectors. While this study provides a critical snapshot of rural musculoskeletal health, robust longitudinal studies with adequate sample sizes are required to define the roles of gender and exercise in rural settings and to further investigate the complex relationship between sociodemographic and anthropometric correlates.

Limitations

Despite the strengths of this study including showing the prevalence of LBP in an occupationally diverse rural community, and highlighting the income, educational level and social class of participants, some limitations were encountered.

The major limitation was the limited sample size, on account of which some major relationships with known predictors of LBP were not corroborated by this study. This is coherent with the increased probability of a type II error for secondary variables, though the overall recruitment of 110 reached 83.3% of the 132 target sample size and thus was adequately powered for the main finding. In addition, recruiting respondents who attended a church service enhanced the feasibility of the study, but skewed the sample to ambulatory Christians. However, to minimize sampling bias within this specific setting, consecutive sampling was employed by recruiting all eligible church attendees.

Funding

This research was funded by personal means.

Conflict of interest

The authors have no conflict of interest to declare.

Authors contribution

The study was conceived by BAN, carried out by BAN and TEN, and written up by BAN and TEN.

Acknowledgement

The authors acknowledge the support received from Mrs Sophia Okonta in analysing the data.

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