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Original Research Article

Determinants of low back pain in Port Harcourt

Brownson Ekwogo Niabari*, Harcourt Somiari Lucky

Department of Surgery, Division of Orthopaedic Surgery, University of Port Harcourt Teaching Hospital, East West Road, Port Harcourt, Nigeria

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***Correspondence:**
Brownson Ekwogo Niabari,
E-mail: niabrownson@yahoo.com

ABSTRACT

Background: There are several known risk factors of low back pain. In Port Harcourt traditional beliefs/myths about low back pain aetiology exist, hence the need for this study. The objectives of this study are to determine the risk factors for low back pain, validate or debunk traditional beliefs and propose preventive measures where possible.
Methods: This was a questionnaire based cross-sectional study design carried out in Port Harcourt. Study population were 411 residents 18 years and above who gave verbal consent. Data were analysed using IBM SPSS version 25.
Results: The point prevalence of low back pain was 78%. The male to female ratio of the respondents was 1:1.25 with 61.1% of ages 20-45years. Low back pain was commoner, 91.7% among participants 65 years and above. Several variables, age (p value 0.014), pregnancy and delivery (p value 0.001), frequent sexual intercourse (p value 0.003), occupation as a trader ((p value 0.034), improper sitting posture (p value 0.008), been married (p value 0.003) and use of mattresses (p value 0.001) were associated with low back pain.
Conclusions: This study debunked the association of vaginal delivery, epidural analgesia, family history and parity with low back pain. It validates the belief that pregnancy and delivery, frequent sexual intercourse, occupation, improper sitting posture and use of soft mattresses were associated with low back pain. We propose use of firm mattresses and proper sitting posture as preventive measures for low back pain.

Keywords: Low back pain, Soft mattress, Sexual frequency, Sitting posture, Pregnancy

INTRODUCTION

Lower back pain is commonly defined as "pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without referred leg pain".[1] It is the most common musculoskeletal condition in developed countries, despite improved access to better healthcare.[2] The morbidity and economic impact of LBP are high. This has both direct and indirect effects on the economy. The direct effects result from medical expenditures and the indirect effects are a consequence of loss of work hours and productivity. In the USA, the combined impacts of LBP results in annual loss of about $635 billion.[3] This annual loss will be economy-crippling in the developing countries hence the need for primary prevention which is possible only when the risk factors in the environment are known. It is estimated that 60-85% of people will develop acute low back pain in their lifetime and most of this pain resolve complete with only a few progressing to chronic low back pain.[4] Low back pain is categorized as acute, subacute or chronic depending on its duration and progression.[4] Acute pain lasts for less than 6 weeks and chronic pain persists for longer than 12 weeks.[4] As stated above, most of the acute low back pain resolved completely, with only a small percentage progressing to become chronic. The latter remains a nightmare for spine surgeons because of management challenges. The prevalence of low back pain varies among geographical locations and hence authors. Anderson et al report a chronic low back pain prevalence of 15-45% in Sweden while Nottidge et al reported a point prevalence of 42% in southern Nigeria.[5,6] Low back pain, especially the chronic variant, is a complex and challenging entity to manage. For this reason, primary prevention should be given a central

place in the management. However, it is difficult to identify the determinants/aetiological factors of low back pain. The role of psychosocial factors in the persistence of pain further compounded this issue.

Several risk factors have been identified for the aetiology of low back pain in Asia and other Western countries. Such factors include, but are not exclusive to, smoking, use of vibrating tools, frequent repeated trunk movements, BMI, and age. However, there are limited reports on the determinants of low back pain in Nigeria hence there is a need for this study. In addition, myths and popular presumed traditional aetiological factors of LBP need to be debunked or validated.

METHODS

Study area

The study was carried out at Port Harcourt, River state, Nigeria.

Study design

This was a questionnaire-based cross-sectional study carried out in Port Harcourt. The study population comprised 411 residents, aged ≥18 years who gave verbal consent.

Sampling size

Questionnaires were distributed based on the sample size which was determined using the Cochran formular.[7]

N=Z2 pq, d2 where q=1-p, Z=1.96 at 95% confidence interval, p=prevalence=42%, d=desired level of precision i.e., margin of error=0.05 i.e., 5%.

Inclusion criteria

Individuals aged 18 years and above from different population groups were interviewed based on their location. The study included participants recruited from various settings, including hospitals, tertiary academic institutions, markets, industrial areas, churches and randomly selected individuals encountered on the streets. This approach ensured representation from a diverse range of social and occupational backgrounds within the study population.

Exclusion criteria

Individuals below 18 years of age were excluded from the study.

Data collection

A self-administered questionnaire was given to each participant after obtaining a verbal consent. Minimal assistance was given in the form of explanation of some terms and calculation of BMI after height and weight measurements.

Data analysis

The data received were entered into Microsoft excel spreadsheet and exported to IBM SPSS version 25 which was used for the analysis. Means were calculated for quantitative variables. Test for significance ($p<0.05$) was done using Chi-square and independent sample t-test as indicated.

Ethical approval

The ethical approval for this study was waived.

RESULTS

401 people who met the inclusion criteria completed the questionnaires. Ten questionnaires, which were incompletely filled were discarded. The information obtained was analysed, with 78.3% reporting history of LBP at the time of the interview, while male-female ratio of the respondents was 1:1.25. The age distribution of the participants is displayed (Table 1). 61.1% of the study population were within 20-45 years, while LBP was common in 91.7% of the participants aged 65years and above.

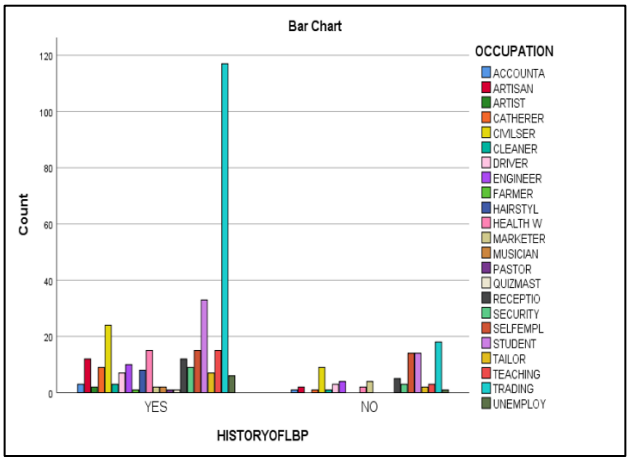

Figure 1: Relationship between LBP and occupations.

Table 1: Age distribution.

Age (years)	Frequency (N)	Percentage (%)
18-20	25	6.2
20-45	245	61.1
45-65	107	26.7
>65	24	6.0
Total	401	100.0

The relationship between low back pain and the different occupations were analysed (Figure 1). This relationship was found to be statistically significant at a p value of

0.034. Trading was associated with the highest prevalence (37.3%), as 86.7% of traders had low back pain. Analysis of the nature of work shows that 39.2% of the participants are involve in work that require equal duration of sitting and standing, 29.2% in prolonged sitting, 18.5% in prolonged standing, 10.8% in forward bending and only 2.2% were involved in heavy lifting.

Table 2: The relationship between the different variables/risk factors and LBP.

Variables/determinants	Low back pain	No low back pain	P value
Gender (male)	135	43	0.285
Gender (female)	179	44	
Age (18-20 years)	19	6	0.014*
Age (20-45 years)	180	65	
Age (46-65 years)	93	14	
Age (>65 years)	22	2	
Smoking (no)	260	77	0.199
Smoking (yes)	54	10	
History of giving birth (yes)	118	14	0.001*
History of giving birth (no)	62	30	
Mode of delivery (SVD)	64	9	0.393
Mode of delivery (CS)	17	3	
Mode of delivery (both)	38	2	
Epidural anaesthesia (yes)	43	2	0.094
Epidural anaesthesia (no)	74	12	
Sexual activity (yes)	269	68	0.076
Sexual activity (no)	42	19	
Sexual frequency (1-2 times)	84	16	0.003*
Sexual frequency (3-4 times)	82	19	
Sexual frequency (5-6 times)	46	9	
Sexual frequency (7-8 times)	25	3	
Sexual frequency (>8 times)	30	20	
Nature of work (prolong sitting)	86	31	0.093
Nature of work (prolong standing)	64	10	
Nature of work (forward bending)	38	5	
Nature of work (heavy lifting)	7	2	
Nature of work (equal duration of sitting/standing)	118	39	
Practice of proper sitting posture (no)	152	32	0.008*
Practice of proper sitting posture (yes)	112	47	
Family history of low back pain (no)	171	54	0.135
Family history of low back pain (yes)	143	31	
Regular exercise (no)	145	36	0.609
Regular exercise (yes)	167	51	
Mattress type (soft)	217	39	0.001*
Mattress type (firm)	97	48	
No. of children (1)	17	6	0.065
No. of children (2)	24	4	
No. of children (3)	22	3	
No. of children (4)	18	1	
No. of children (>4)	37	1	
Marital status (married)	165	31	0.003*
Marital status (single)	132	55	
Marital status (cohabiting)	12	0	
Marital status (divorced)	5	1	
Sit-up (no)	182	54	0.491
Sit-up (yes)	132	33	
Occupation			0.034

*Values were significant ($p<0.05$).

Table 3: Mean body mass index (BMI) in people with and without LBP.

	History of LBP	Number (n)	Mean	Standard deviation	Standard error mean
BMI	Yes	308	34.9173	139.99177	7.97677
	No	87	26.8813	4.30910	0.46198

Several variables/risk factors were evaluated for their roles in the aetiology/prevalence of low back pain, using cross-tabulation and significance testing analysis (Table 2). Among the study population, the variables with significant association with LBP were age, positive history of giving birth, sexual frequency, Practice of proper sitting posture, and mattress type.

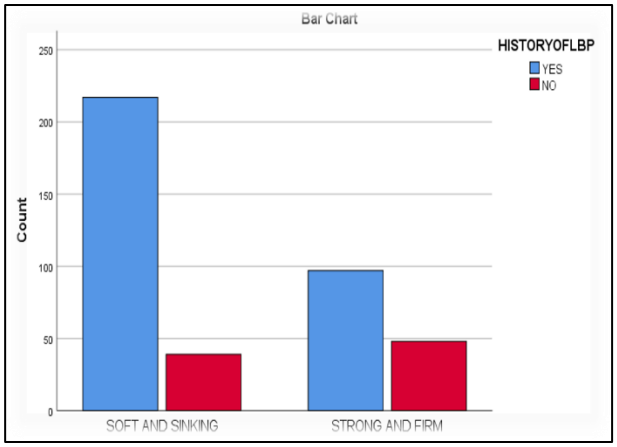

Figure 2: Relationship between mattress type and LBP.

The relationship between mattress type and LBP was reported (Figure 2). The use of soft mattress was associated with a higher incidence of LBP. Although the mean BMI was higher in participants with LBP, this difference was not statistically significant at p value of 0.315 (Table 3).

DISCUSSION

Low back pain is the commonest reason for visit to orthopaedic clinics. The prevalence varies among different populations and studies. In this study the point prevalence of LBP is 78.3%. This prevalence is very high compared to that reported by Anderson and Nottidge et al who studied only patients with chronic low back pain.[5,6] In addition, the later study was a hospital-based study involving hospital staffs only which is not very representative of the general population.

The high prevalence in this study may be due to the inclusion of patients with acute and chronic low back pain. Wallner-Schlotfedt and Stewart reported a prevalence of 43% in their study.[8] A systemic review by Farahbakhsh et al revealed a point prevalence of 10-67% among athletes.[9] The prevalence of LBP was high in female compared to the male gender. This is like results reported by other researchers.[6] The reasons for this difference are not clear however some researchers have attempted to explain it. Menstrual cycle fluctuations in pain sensitivity, biologic response to pregnancy and childbearing, physical stress of child-rearing, perimenopausal abdominal weight gain have been reported as probable reasons.[10,11] Inspite of this high prevalence, there was no statistically significant relationship between gender and risk of LBP.

There is a significant relationship, in this study, between age and the risk of LBP. This relationship may be due to the higher rate of degenerative spinal diseases in the elderly and even the reasons given above for the higher prevalence in females.[10,11] Similar association between age and LBP have also been reported by other authors.[12,13]

Some patients have attributed their back pain to spinal injection given during surgeries and deliveries. Other studies have also suggested the link between epidural analgesia and postpartum low back pain.[14-16] Contrary to the above, we do not find any significant relationship between LBP and epidural injection. Our finding is similar to that reported by other researchers which confirm that epidural analgesia is not a risk factor for LPB.[17-20] We believed that the LBP following post-partum epidural analgesia is due to other factors, as reported by Riley et al and Bailey like the physical and psychological stress of pregnancy and child rearing.[10,11] The role of inappropriate sitting posture during breastfeeding also needs to be studied.

The place of social lifestyle on the risk of LBP is well known. In this study we did not find any significant risk association between smoking and LBP. Contrary to our findings, Hao-Ran et al reported a dose dependent association between smoking and the incidence of LBP.[21]

Same findings were also reported by several other authors.[22,23] Elmasry et al attributed the vascular effects of smoking on the nutrition of the intervertebral disc which leads to increased rate of degeneration as a strong risk factor for low back pain.[23] Dionne et al also supported the known association of tobacco smoking with LBP however they believe this can be explained by other biomarkers other than cotinine.[24] Our finding is contrary to widely confirm studies. This difference may be explained by our small sample size and other confounding factors.

There is a traditional belief, in most communities, that sexual activities are associated with increased prevalence of low back pain. We found a significant relationship between sexual frequency and the prevalence of LBP. This finding contrasts with that in a study in southern Nigeria by Gabriel et al who reported that there was no significant association between sexual frequency, marital status and

the occurrence of low back pain.[25] The effect of low back pain on sexual function has also been studied. Nikoobaht et al reported a higher prevalence of sexual issues in patients with low back pain.[26] Could this LBP have been caused by sexual activities? Sidorkewicz and colleague in their study on male spine motion during coitus, stated that the exacerbation of back pain during coitus is mechanical due to spine motion and sex position.[27]

We believe that this repetitive spinal motion and spinal strain from some sex position/activity may be responsible for the increase prevalence of LBP in patients who indulge in frequent coitus. Like sexual frequency, prolong abnormal sitting posture is believed to affect spinal alignment leading to biomechanical stress and strain on supporting structures of the lower back.[28] Although some authors believed that there is nothing like correct sitting position, we found a significant relationship between improper sitting posture and the prevalence of LBP.[29] Although the exact relationship between abnormal spinal alignment during prolonged abnormal sitting position and the risk of LBP needs to be studied, we believed that it is a risk factor.

Like abnormal sitting posture, the use of soft sinking mattress is commonly believed to cause low back pain. Although studies have shown improvement of back pain with the use of medium firm surfaced mattress and air mattress, although the causal relationship between low back pain and mattress types is not generally accepted.[30,31] In this study we found a significant relationship between mattress type and low back pain. LBP was commoner in patients using soft mattress, 84.8% as against 66.9% in people that use firm mattresses.

This relationship may be due to some confounding factors or from the spinal alignment forced by the sinking spine-deforming soft mattress. If sleeping on some types of mattresses can improve back pain, can sleeping on some types of mattresses also cause LBP? This question seems to be answered by this study although further elaborate investigations need to be carried out. Low back pain is common in pregnancy with prevalence varying among researchers. Omoke et al reported a prevalence of 35% while Saxena et al reported a point prevalence of 80%.[32,33] Although the aetiology of pregnancy related LBP is poorly understood, it is loosely believed to be multifactorial. Mechanical and hormonal factors and even weight gain in pregnancy have been implicated.[34,35]

The question that needs answer is" what percentage of LBP in pregnancy proceed beyond pregnancy". Although we found a statistically significant relationship between history of delivery and LBP, it is difficulty to assume a causal relationship as we did query if the LBP is a continuum of the pregnancy-related LBP. Increase in BMI is a known risk factor for LBP.[6,36] The result of this study is contrary to the well-known association between BMI and LBP. Although the mean BMI was higher in participants with LBP, this was not statistically significant.

Limitations

Our study was limited by smaller sample size, inclusion of participants with both acute and chronic low back and inability to deliberately identify participants whose LBP were a continuation of pregnancy-related LBP.

CONCLUSION

LBP is a unique entity whose aetiology/ risk factors remain shrouded in myth and controversies. Increases sexual frequency, use of soft sinking mattresses, pregnancy with delivery, age, improper sitting posture, trading and cohabiting with a partner were identified as risk factors for LBP. Contrary to traditionally held believe epidural anaesthesia, mode of delivery and number of children were not associated with increased risk of low back pain. Although we believe further studies are needed, we also believe that the use of firm mattress, proper sitting posture and change in sexual position can reduce the risk of LBP.

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