

# Low back pain as seen in orthopedic clinics of a Nigerian Teaching Hospital

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## Abstract

**Background:** Low back pain is not a specific disease though a common health concern worldwide. There is regional variation in its etiology and patterns of presentation. In West African sub-region, there are very limited data on this important aspect of low back pain.

**Objective:** We aimed to determine the etiology and pattern of presentation of low back pain among patients seen in our orthopedic outpatient clinics.

**Materials and Methods:** This was a retrospective review of database of all new patients with low back pain seen at the orthopedics clinics of Federal Teaching Hospital, Abakaliki between 2003 and 2013.

**Results:** There were 2914 new patients seen in the orthopedic clinics –291 (10%) of them presented with low back pain. The female to male ratio was 1:1.04 and the mean age was  $45.8 \pm 1.67$  years. The mechanical low back pain was involved in 82.1% of the patients, and the incidence was significantly higher in females than males (53.1% vs. 46.9%,  $P < 0.003$ ). The males were significantly more afflicted than females by pain from spinal infections (58.3% vs. 41.7%) and tumors (92.3% vs. 7.7%  $P < 0.003$ ). Low back pain associated with radiculopathy was observed in 75 (25.7%) patients and the incidence was significantly higher in the married than the singles (30.2% vs. 13.9%,  $P < 0.005$ ). Lifting of heavy object was the most common predisposing factor of low back pain. Hypertension and peptic ulcer disease were two top medical co-morbidities while osteoarthritis of hip and knee was the most common associated musculoskeletal disorders.

**Conclusion:** Low back pain of mechanical origin (recurrent and chronic in a significant proportion of patients) is predominant in our environment. This pattern calls for prevention as well as the early and appropriate care of the patient with low back pain.

**Key words:** Disc prolapse, low back, mechanical, Nigeria, pain, radiculopathy, spondylosis

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## Introduction

Low back pain is a common health concern worldwide. In developed countries, the estimated prevalence of low

back pain in a lifetime ranged from 30% to 79.2%.<sup>[1-3]</sup> In a recent systematic review, the lifetime prevalence of low back pain in Africa ranged from 28% to 74% and was almost comparable to the rates in the Western societies.<sup>[3]</sup> The disability and morbidity associated with low back pain are a significant burden. In the USA, low back pain is the second most common cause of disability in adults and the

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second most frequent reason for the visit to the physician or medical consultation.<sup>[4]</sup>

Low back pain by definition is pain in the region between the lower margin of the 12<sup>th</sup> rib and the gluteal folds with or without distal radiation to the lower extremity.<sup>[5]</sup> International association for the study of pain defines pain as an unpleasant sensory or emotional experience associated with actual or potential tissue damage or described in terms of such damage.<sup>[6]</sup> All the aspects of pain in this definition are applicable to low back pain. Therefore, low back pain is neither a specific disease nor a diagnostic entity - rather a symptomatic manifestation of actual or potential tissue damage of varying degree of severity. The actual or potential tissue damage that results in low back pain could be mechanical (musculoskeletal strains, nerve root compression, herniated disc, and degenerative disc and joints) or nonmechanical (inflammatory conditions, infection, or tumor) in origin. In addition to these physical causes, referred pain in disorders of internal organs (kidney stones and infection) can also present as low back pain.<sup>[7]</sup> Pain as an unpleasant emotional experience implies that it can be incurred without any definable physical cause. Thus, in some cases of low back pain, nothing abnormal is found despite numerous investigations.<sup>[8]</sup> The physical and psychosocial factors that come to play in the etiology of low back pain are generally the same worldwide. However, the extent of involvement of these factors as well as the pattern of low back pain with respect to etiology and population characteristics varies from and within countries.

The management of the bulk of the patients with low back pain is at the primary and secondary levels of health care.<sup>[9]</sup> The tertiary level of care as a referral center is also involved depending on the nature of the underlying problem.<sup>[10,11]</sup> Knowledge about the etiology of low back pain and its pattern of presentation in a tertiary care setting could facilitate measures aimed at optimum care. In West African sub-region, there is a paucity of published studies on the etiology and pattern of presentation of low back pain at the tertiary level of care setting.

The aim of this study was to determine the etiology and pattern of presentation of low back pain in our orthopedic clinics.

## Materials and Methods

This was a retrospective study of all the new patients with low back pain seen at the orthopedics clinic of Federal Teaching Hospital, Abakaliki between 2003 and 2013. Federal Teaching Hospital, Abakaliki is one of the major teaching hospitals in South-East of Nigeria. It came into existence in January 2011 after a merger of Ebonyi State University Teaching Hospital (founded in 1996) and

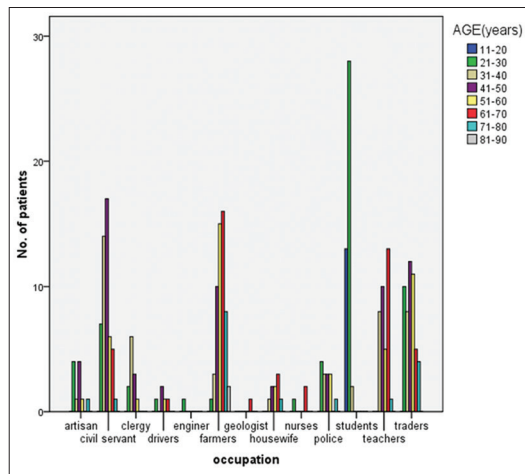
Federal Medical Centre, Abakaliki. With the approval of the Hospital Ethics and Research Committee, the case notes of patients were used as the source of data. This study excluded patients seen in the Federal Medical Centre prior to the merger.

In the hospital orthopedic clinic, a Consultant Orthopedic Surgeon or a Senior Registrar evaluated every new patient and made a definitive diagnosis after relevant diagnostic and laboratory studies. Thus, following a detailed history and clinical examination, all the patients with low back pain had a plain Lumbosacral spine radiograph, urinalysis, full blood count, and erythrocyte sedimentation rate as baseline investigations. The use of other investigations such as abdominal and pelvic ultrasound scan, chest radiograph, bone aspiration and biopsy for microbiological and histopathological diagnosis, serum electrophoresis, serum protein, serum calcium, phosphate and alkaline phosphatase, prostate-specific antigen, and Mantoux test depended on the leads from clinical assessment. Imaging studies such as myelogram, computed tomography (CT), and magnetic resonance imaging (MRI) were used when there was neurological deficit or serious underlying pathology suspected from clinical and baseline studies. The detailed history, physical finding, and result of diagnostic and laboratory investigations were documented in each patient case note. The information extracted from these case notes such as the source of referral of the patients to the orthopedic clinic, demographic characteristics, duration, etiology, risk factors and characteristics of low back pain, co-morbidities, and results of diagnostic and laboratory investigations was the source of data in this study. Low back pain was classified based on duration at presentation into acute (0–6 weeks), sub-acute (7–12 weeks), and chronic (>12 weeks).<sup>[7]</sup>

Data analysis was done using Statistical Package for Social Sciences, SPSS version 16 (Chicago, SPSS Inc.). Frequency tables, cross tabulation, Fisher's exact test tables, and Pearson Chi-square test of significance were used. For all statistical analysis,  $P < 0.05$  was considered as statistically significant.

## Results

Within the 11-year period, 2914 new patients were seen in the orthopedic clinics and 291 (10%) of them presented with low back pain. Two hundred twenty-four of them (77.3%) presented to the orthopedic clinic as referrals from the hospital General Outpatient Department whereas 22.7% were referral from other specialist clinics in the hospital. All the patients had plain lumbosacral spine radiographs, results of baseline and other relevant laboratory studies while nine patients had further imaging studies (seven had MRI and two had CT myelogram). There were 143 females and 148 males, and male to female ratio was 1.04:1. Two-hundred twelve (72.9%) were married whereas



**Figure 1:** Incidence of low back pain by occupation and age group

**Table 1: Incidence of LBP by occupation and sex distribution**

Occupation	Sex (%)		Total (%)
	Female	Male	
Farmers	27 (18.9)	28 (18.9)	55 (18.9)
Traders	22 (15.4)	28 (18.9)	50 (17.2)
Civil servants	26 (18.2)	24 (16.2)	50 (17.2)
Students	22 (15.4)	21 (14.2)	43 (14.8)
Teachers/lecturers	21 (14.7)	16 (10.8)	37 (12.7)
Police/security officers	4 (2.8)	10 (6.8)	14 (4.8)
Clergy/religious	4 (2.8)	8 (5.4)	12 (4.1)
Artisans	4 (2.8)	7 (4.7)	11 (3.8)
Housewives	9 (6.3)	0 (0.0)	9 (3.1)
Drivers	1 (0.7)	4 (2.4)	5 (1.7)
Nurses	3 (2.1)	0 (0.0)	3 (1.0)
Geologist	0 (0.0)	1 (0.7)	1 (0.3)
Engineers	0 (0.0)	1 (0.7)	1 (0.3)
<b>Total</b>	<b>147 (100)</b>	<b>148 (100)</b>	<b>291 (100)</b>

LBP=Low back pain

**Table 2: Etiology of LBP by sex distribution**

Etiology	Female (%)	Male (%)	Total (%)
<b>Mechanical</b>			
Spondylosis	69 (48.3)	56 (37.8)	125 (43.0)
Disc prolapse	29 (20.3)	39 (26.4)	68 (23.4)
Spondylolisthesis	15 (10.5)	7 (4.7)	22 (7.6)
Back strain	12 (8.4)	9 (6.1)	21 (7.2)
Sacroiliac joint sprain	2 (1.4)	1 (0.7)	3 (1.0)
<b>Infection</b>			
Tuberculous spondylitis	12 (8.4)	19 (12.8)	31 (10.7)
Pyogenic spondylitis	3 (2.1)	2 (1.4)	5 (1.7)
<b>Tumor</b>			
Metastatic spinal tumor	1 (0.7)	10 (6.8)	11 (3.8)
Multiple myeloma	0 (0.0)	2 (1.4)	2 (0.7)
<b>Congenital</b>			
Lumbarization of spine	0 (0.0)	3 (2.0)	3 (1.0)
<b>Total</b>	<b>143 (100.0)</b>	<b>148 (100.0)</b>	<b>291 (100.0)</b>

$\chi^2=20.61$ ;  $df=9$ ;  $P=0.015$ . LBP=Low back pain

79 (27.1%) of them were single. Among the females, 76.9% were married, and 23.1% were single while 68.9% of the males were married and 31.1% were single ( $P = 0.125$ ).

The ages ranged from 12 to 85 years with a mean of  $45.8 \pm 1.67$  years and a median of 45 years. The peak age incidence was 41–50 years. Farmers (55) accounted for 18.9% of the patients. Traders, civil servants, students, and teachers accounted for (50) 17.2%, (50) 17.2%, (43) 14.8%, and (37) 12.7% of the patients, respectively as shown in Table 1. The peak age of incidence for each occupational group varies from one another as shown in Figure 1. The incidence of low back pain increased from the fourth decade, doubled in the fifth decade, reached a peak in the seventh

**Table 3: Duration of LBP by etiology**

Etiology	Acute (%)	Sub-acute (%)	Chronic (%)	Total (%)
<b>Mechanical</b>				
Spondylosis	25 (31.6)	11 (27.5)	89 (51.7)	125 (43)
Disc prolapse	32 (40.5)	13 (32.5)	23 (13.4)	68 (23.4)
Spondylolisthesis	2 (2.5)	4 (10.0)	16 (9.3)	22 (7.6)
Back strain	8 (10.1)	5 (4.7)	8 (12.5)	21 (7.2)
Sacroiliac joint sprain	3 (3.8)	0 (0.0)	0 (0.0)	3 (1.0)
<b>Infection</b>				
Tuberculous spondylitis	2 (2.5)	4 (10.0)	25 (14.5)	31 (10.7)
Pyogenic spondylitis	1 (1.3)	0 (0.0)	4 (2.3)	5 (1.7)
<b>Tumor</b>				
Metastatic spinal tumor	4 (5.0)	2 (5.0)	5 (2.9)	11 (3.8)
Multiple myeloma	2 (2.5)	0 (0.0)	0 (0.0)	2 (0.7)
<b>Congenital</b>				
Lumbarization of spine	0 (0.0)	1 (1.2)	2 (2.5)	3 (1.0)
<b>Total</b>	<b>79 (100.0)</b>	<b>40 (100.0)</b>	<b>172 (100.0)</b>	<b>291 (100)</b>

$\chi^2=58.5$ ;  $df=9$ ;  $P=0.000$ . LBP=Low back pain

**Table 4: Incidence of LBP associated with radiculopathy by population characteristics**

Characteristics	LBP with radiculopathy (%)		Total (%)	$\chi^2$	P
	Yes	No			
<b>Age (years)</b>					
0-17	0 (0.0)	0 (100.0)	1 (0.3)	18.92	0.000
18-39	16 (14.4)	95 (85.6)	111 (38.1)		
40-65	53 (37.1)	90 (62.9)	143 (49.1)		
>65	6 (16.7)	30 (83.3)	36 (12.4)		
<b>Sex</b>					
Male	42 (28.4)	106 (71.6)	148 (50.9)	1.068	0.301
Female	33 (23.1)	110 (76.9)	143 (49.1)		
<b>Marital status</b>					
Single	11 (13.9)	68 (86.1)	79 (27.1)	7.958	0.005
Married	64 (30.2)	148 (69.8)	212 (72.9)		
<b>Smoking</b>					
Yes	8 (34.8)	15 (65.2)	23 (7.9)	1.060	0.303
No	67 (25)	201 (75)	268 (92.1)		

LBP=Low back pain

**Table 5: The incidence of co-morbidities in LBP**

Co-morbidity	Number of patients	Percentage
<b>Medical co-morbidities</b>		
Hypertension	63	21.7
Peptic ulcer disease	16	5.5
Diabetes mellitus	13	4.5
Depression and anxiety disorders	5	1.7
CVA	3	1.0
COAD	3	1.0
Toxic goiter	2	0.7
<b>Musculoskeletal disorders</b>		
Osteoarthritis of the knee	31	10.7
Osteoarthritis of the hip	10	3.4
Cervical spondylosis	7	2.4
Rotator cuff syndrome	3	1.0
Osteoarthritis of the shoulder	1	0.4
Neglected club foot	1	0.4
Total	158	54.4

CVA=Cerebrovascular accident; COAD=Chronic obstructive airway disease; LBP=Low back pain

decade among farmers whereas it doubled in fourth decade, reached a peak in the fifth decade among civil servants. The incidence among teachers and petty traders reached its peak in the seventh and fifth decades, respectively.

There was mechanical back pain in 239 (82.1%) patients. Mechanical low back pain was significantly higher in females than males (53.1% vs. 46.9%,  $P < 0.003$ ) whereas pain from spinal infections and tumors was more in males than females (58.3% vs. 41.7% and 92.3% vs. 7.7%) [Table 2]. In the tumor-related group, metastasis from cancer of the prostate accounted for low back pain in 7 of 13 patients involved. Lumbosacral spondylosis in 125 (43.1%) of the patients was overall the leading cause of low back pain as well as the most common cause (52.3%) of low back pain of mechanical origin. This is followed by intervertebral disc prolapse that accounted for pain in 68 (23.4%) of the patients [Table 2]. Low back pain attributed to spondylosis, spondylolisthesis, sacroiliac joint strain, and back strain was significantly ( $P < 0.015$ ) higher in female than in males whereas disc prolapse was more in males than females [Table 2]. Degenerative spondylolisthesis was involved in 21 of 22 patients with spondylolisthesis whereas the rest, 1 of 22 was the lytic or isthmic type.

There was history of recurrent episodes of low back pain in 162 (55.7%) of the patients prior to presentation. A significant proportion of patients ( $P < 0.01$ ) with spondylolisthesis (86.4%), spondylosis (72%), back strain (61.9%), and disc prolapse (44.1%) presented with recurrent low back pain. Low back pain was of sudden onset in 111 (38.1%) and of insidious onset in 180 (61.9%) of the patients. Chronic low back pain was observed in 172 (59.1%) patients whereas 79 (27.1%) and 40 (13.7%)

presented with acute and sub-acute low back pain, respectively. Intervertebral disc prolapse, spondylosis, and back strain were significantly ( $P < 0.0001$ ) the leading cause of acute in 32 (40.5%), 25 (20.0%), and 8 (10.1%) of the patients, respectively and sub-acute low back pain in 13 (32.5%), 11 (27.5%) and 5 (12.5%) of the patients, respectively. Spondylosis, Potts disease, and disc prolapse accounted for chronic low back pain in 89 (51.7%), 25 (14.5%), and 23 (13.4%) of the patients, respectively as shown in Table 3.

Low back pain radiated into the lower extremity in 166 (57.1%) of the patients whereas it was localized to the low back region in 125 (43%) of them. The low back pain radiated to the thigh, leg, and foot in 38 (13.1%), 89 (30.6%), and 39 (13.4%) of the patients, respectively. Pain radiated to both lower extremity in 69 (23.7%), to the left in 48 (16.5%), and to the right in 49 (16.8%) of the patients. Low back pain was accompanied by red flags (symptoms or signs suggestive of specific/serious pathology) in 105 (36.1%) of the patients. Fever accompanied low back pain in 15 (5.2%) of the patients whereas weight loss accompanied the pain in 31 (10.7%) of the patients. Neurological symptoms accompanied pain in 93 (32%) of the patients. The observed symptoms were paresthesia 53 (18.2%), numbness 25 (8.6%), paraparesis 17 (5.8%), monoparesis 7 (2.4%), and urine/fecal sphincter dysfunctions 3 (1.03%). Low back pain was associated with radiculopathy in 75 (25.7%) of the patients. The incidence of low back pain with radiculopathy was more in males than female (28.4% vs. 23.2%,  $P = 0.318$ ), significantly higher in married than singles (30.2% vs. 13.9%,  $P < 0.005$ ) and higher in the middle-aged group (40–65) than other age groups [Table 4].

With respect to the location of spinal pathology associated with pain, one spinal vertebrae level was involved in 110 (37.8%) of the patients, 2 in 96 (33.0%), and three or more levels in 31 (10.65%). L4-L5 spinal vertebrae level was involved in 122 (42%). L5-S1 and L2-L3 were involved in 78 (26.8%) and 76 (26.1%) of the patients, respectively.

The most common predisposing factor to low back pain was lifting heavy object 40 (13.8%), followed by trauma that is, previous back injury 26 (8.9%), obesity 11 (3.9%), pregnancy 3 (1.0%), and long distance driving 2 (0.7%). Fall from height, road traffic injury, and assault accounted for 55.3%, 38%, and 7.7% of trauma-related risk factors, respectively. Traditional bonesetters attended to the back injuries sustained by all the patients who fell from a height.

The three top co-morbidities were hypertension (21.7%), peptic ulcer disease (5.52%), and diabetes mellitus (4.48%) as shown in Table 5. Chronic low back pain accounted for 61.9% of the patients that presented with hypertension as co-morbidity whereas sub-acute in 14.3% and acute low

back pain in 23.8% accounted for the rest. The three top associated musculoskeletal disorders were osteoarthritis of the knee (10.7%), osteoarthritis of the hip (3.1%), and cervical spondylosis (2.4%) [Table 5].

## Discussion

The result of this study indicates that there was no significant gender bias with a male to female ratio of 1.04:1. This differs from female predominance (male to female ratio of 1:2) documented in other studies. Galukande *et al.* reported male to female ratio of 1:2 in a similar setting at Uganda<sup>[10]</sup> whereas Eyichukwu and Ogugua in Nigeria<sup>[11]</sup> reported a ratio of 1:1.5. On the other hand, Omokhodion reported a higher prevalence in male than female (45% vs. 36%) in a rural community South West Nigeria, which has the highest prevalence of low back pain among farmers (mostly males).<sup>[12]</sup> In our study, though farmers were the highest in occupational distribution of patients, there was no significant difference in the number of male and female farmers as shown in Table 1. Thus, occupational factor is not an explanation for the male to female ratio observed in this study; the reason is not also evident.

The mean age of 45 years observed in this study is almost similar to mean age reported in other previous studies.<sup>[9,11]</sup> However, the peak age incidence in this study (41–50 years) differs from 31 to 40 years reported by Eyichukwu and Ogugua.<sup>[11]</sup> The pattern of variation of peak age of incidence among occupational groups in this study [Figure 1] indicates that the incidence of low back pain in workers engaged in sedentary jobs and lifestyle such as civil servants and traders in Nigeria rises and reaches its peak two decades earlier than those engaged in physically demanding job such as farmers.

The predominance of mechanical low back pain (82.1%) is similar to 80% reported by Eyichukwu and Ogugua and within the range of 80–90% documented for developed or high-income nations.<sup>[11,13]</sup> Lumbosacral spondylosis we observed as the most common cause of mechanical low back pain is similar to the finding reported by Eyichukwu and Ogugua<sup>[11]</sup> and Mijiyawa *et al.*<sup>[14]</sup> This is at variance with the finding of lumbar strain and sprain as the predominant cause (70%) of mechanical low back pain in the United States of America.<sup>[15]</sup> On the other hand, back strain accounted for 16.8% of mechanical back pain observed in this study. A plausible explanation of this variation is that majority of the patients in our study were referral from primary and secondary levels of care where majority of patients with low back strain may have responded to treatment hence its relatively lower incidence observed in our orthopedic clinic. The finding of low back pain from spinal infections significantly more in males than female is in keeping with the preponderance of vertebrae osteomyelitis in males over females reported by other studies.<sup>[15,16]</sup>

The aim of the treatment of patients with low back pain was to prevent recurrence and transition to chronicity. This aim is achievable with early adequate treatment and activity modification guided by the identified risk factors. There is complete resolution of acute back pain in the majority of cases seen at primary care level.<sup>[17,18]</sup> However, in published reports, the proportion of cases that transit to chronicity varied from 2% to 34%.<sup>[17-19]</sup> Notwithstanding, the incidence of chronic low back pain (59.1%) we observed is high. Eyichukwu and Ogugua also reported a higher incidence of 73.1% from another Nigerian setting.<sup>[11]</sup> Delay in presentation to hospital is an important factor in the high incidence of chronic low back pain in this study. In a previous published report, the majority of African patients who develop insidious onset of symptoms initially resort to self-medication, consultation of the herbalist, spiritualist, and traditional bonesetters.<sup>[11]</sup> Low back pain was of insidious onset in 69.1% of the patients in this study, hence the delay in presentation to the hospital. The involvement of tuberculosis of the spine (chronic spinal infection) in the etiology of low back pain is also a factor in the high incidence of chronic low back pain we observed. In our setting, the majority of the patients with chronic and recurrent low back pain seen at lower level of care ends up as referral to the orthopedic clinic. In this study, the high incidence (55.7%) of recurrent episodes of low back pain prior to presentation is in keeping with the observed pattern of chronicity. Recurrent episodes of low back pain prior to presentation in a significant proportion of patients with pain of mechanical origin calls for educational program to enlighten the public on the importance of early presentation and adequate treatment of low back pain to prevent recurrence and transition to chronicity.

In the majority of our patients (57.1%), low back pain radiated to the lower extremity. This is not too far from the 50% reported by Shakoore *et al.*<sup>[18]</sup> Low back pain was associated with radiculopathy in 25.7% of the patients in this study, it differ from the 32.5% reported by Eyichukwu and Ogugua.<sup>[11]</sup> The incidence of low back pain associated radiculopathy is significantly higher in married than singles in this study. The reason for this observation is not evident and requires another study.

The most important predisposing factor was lifting heavy object observed in 13.8% of the patients. This is at variance with the finding of trauma as the most common predisposing factor (in 13.1% of the patients) reported by Eyichukwu and Ogugua.<sup>[11]</sup> However, trauma to the back was next to lifting objects in the predisposing factor of back pain in the patients we studied. The majority of our patients with trauma-related predisposing factor had their back injuries poorly treated by traditional bonesetters. Therefore, the importance of public enlightenment program cannot be overemphasized.

In this study, there was co-morbidity in over half of the patient with low back pain as shown in Table 5. Chronic painful condition as low back pain is associated with increased prevalence of hypertension.<sup>[20]</sup> The majority of our patients presented with chronic low back pain that accounted for 61.9% of the patients with hypertension as co-morbidity. This explains the high incidence (21.7%) of hypertension as co-morbidity in this study. There was peptic ulcer disease in 5.5% of the patients, a co-morbidity that can influence the choice of analgesics prescribed for the patient. The incidence of depression and anxiety disorder as a co-morbidity we observed in 1.7% of the patients differ from the finding of 19.8% major depression in patients with chronic back pain reported by Currie and Wang.<sup>[21]</sup> In our study, there was no routine use of interview to screen patients for depression and psychological distress whereas Currie and Wang used the short-form of the composite international diagnostic interview in their study. The exact incidence of depression and psychological distress associated with low back pain in our setting requires another study.

The limitations of this study are: (1) It is a retrospective study with problems of incomplete record documentation. (2) It is a hospital-based study; the data may not be representative of the entire population.

## Conclusion

Low back pain of mechanical origin (recurrent and chronic in a significant proportion of patients) is predominant in our environment. Lifting heavy object and previous back injuries were the two top predisposing factors observed. This pattern calls for prevention as well as the early and appropriate care of patients with low back pain.

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## Conflicts of interest

There are no conflicts of interest.

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