

Original Research Article

Etiological Status and Treatment Outcomes of Low Back Pain of the Patients Treated in Tertiary Level Hospitals

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Abstract: **Introduction:** Low back pain (LBP) is a widespread musculoskeletal disorder affecting millions globally, contributing significantly to disability, reduced productivity, and impaired quality of life. It is a leading cause of disability, impacting both developed and developing nations worldwide. **Objective:** The aim of this study was to investigate the etiological status and treatment outcomes of LBP among patients treated under the orthopedic department of a tertiary level hospital in Bangladesh. **Methods:** This prospective observational cross-sectional study was conducted jointly at the Department of Orthopedics in Bangladesh Central Police Hospital (CPH), Dhaka, Bangladesh and at the department of Physical Medicine, Shahabuddin Medical College Hospital, Dhaka, Bangladesh, during July 2024 to December 2024. Consecutive sampling method was applied, and a total of 300 patients aged ≥ 15 , presenting with low back pain (LBP) at the outpatient department (OPD) were enrolled in this study. The collected data were methodically organized and analyzed using Statistically Package for Social Sciences (SPSS), Version-23.0. **Results:** A total of 300 patients presenting with low back pain (LBP) were enrolled in this study. The mean age of the patients was 46.9 ± 2.57 years. The most common age group was 41-50 years, comprising 70 (37.6%) patients. The majority of the patients were females (109, 58.6%). Hypertension (HTN) was the most prevalent comorbidity, present in 84 (45.2%) patients. Among the patients with mechanical pain, spondylosis was the most frequent cause, observed in 130 (43.33%) patients, which included acute pain in 65 (50%), sub-acute in 20 (15.38%), and chronic in 45 (34.61%). Disc prolapse accounted for 122 (40.67%) patients, with 56 (45.90%) acute, 18 (14.75%) sub-acute, and 48 (39.34%) chronic presentations. Other notable mechanical causes included back strain 109 (36.33%), spondylolisthesis 80 (26.67%), sacroiliac joint sprain 29 (9.67%), and spinal stenosis 22 (7.33%). For infection-related causes, epidural abscess and septic diskitis contributed to 1 (3.67%) patients combined, with 6 (54.55%) acute, 2 (18.18%) sub-acute, and 5 (27.27%) chronic cases. Among neoplastic causes, there were 8 (2.67%) of lesion and primary tumors, with 5 (62.5%) acute, 2 (25.0%) sub-acute, and 3 (37.5%) chronic cases. Inflammatory causes, including spondyloarthritis and non-specific pain, were contributing only 2 (0.67%), with 1 (50%) acute and 2 (50%) chronic cases. Surgery cases ($n=31$) were excluded and ($n=269$) patients were given conservative treatment and at 3 month, 131 (48.4%) patients had recovered, 121 (34.9%) patients showed improvement, 34 (11.3%) patients remained stable, and 13 (5.4%) patients were referred. At 6 month, percentages of recovery were improved up to 144 (56.25%), 96 (37.5%) patients improved their condition, 13 (5.07%) patients remained stable, and 3 (1.17%) patients were referred for better treatment to another center. **Conclusion:** This study investigated that the majority of the patients suffering from low back pain (LBP) were middle-aged females. Hypertension was the most common associated disease with study the patients. Conservative treatment approaches were effective in most cases and majority of the patients achieved full recovery, while a significant portion showed improvement. Only a minor portion of the patients remained stable or required further treatment.

Keywords: Etiological, Status, Treatment, Outcomes, LBP, Orthopedic, Department.

INTRODUCTION

Low back pain (LBP) is a widespread musculoskeletal disorder affecting millions globally, contributing significantly to disability, reduced productivity, and impaired quality of life [1-3]. It is a leading cause of years lived with disability worldwide, impacting both developed and developing nations [4]. The condition often arises from a variety of etiological factors, including mechanical issues such as spondylosis, disc prolapse, and spondylolisthesis, along with poor lifestyle habits like prolonged sitting, physical inactivity, and improper posture [5, 6]. In developing countries like Bangladesh, the burden of LBP is substantial due to limited access to specialized healthcare, late diagnosis, and often inadequate treatment strategies [7, 8]. This issue is particularly prominent in tertiary care hospitals where a significant number of patients present with LBP. Despite the hospital's capacity for specialized care, comprehensive data detailing the underlying causes, treatment patterns, and patient outcomes remain scarce [9,10]. LBP may be categorized based on its duration and origin, including acute, sub-acute, and chronic pain. Mechanical causes such as spondylosis and disc prolapse account for most cases, while non-mechanical factors like infections, tumors, and congenital anomalies occur less frequently [11]. Effective treatment modalities for LBP can range from conservative approaches, such as over-the-counter pain medication and physical therapy including surgery interventions. However, the success of these treatments largely depends on early diagnosis, the appropriateness of the intervention, and patient adherence to rehabilitation programs [12]. However, there are very few studies and limited data regarding the etiological status and treatment outcomes of low back pain of the patients in Bangladesh. Therefore, the researcher has designed this study. This study aims of to investigate the etiological status and treatment outcomes of LBP among patients treated under the orthopedic department of a tertiary level hospital in Bangladesh.

METHODS

This prospective observational cross-sectional study was conducted jointly at the Department of Orthopedics in Bangladesh Central Police Hospital (CPH), Dhaka, Bangladesh and at the department of Physical Medicine, Shahabuddin Medical College Hospital, Dhaka, Bangladesh, during July 2024 to December 2024. The study objectives were disclosed to the patients and either verbal or written consent was obtained. Consecutive sampling method was applied, and a total of 186 patients aged ≥ 15 , presenting with low back pain (LBP) at the outpatient department (OPD) were enrolled in this study. After diagnosis, surgery cases (n=31) were excluded from the study and conservative treatment approaches were performed to the rest of the patients (n=269) considering their age, sex, comorbidities and other health related issues. Follow-up period was included to assess treatment outcomes of the study patients at 3 and 6 month. The data were collected through structured interviews and a comprehensive review of medical records using a structured questionnaire and a case record form (CRF), focusing on socio-demographic characteristics, comorbidities, etiological status of LBP, treatment approaches, and treatment outcomes of the study patients. The collected data were methodically organized and analyzed using Statistically Package for Social Sciences (SPSS), Version-23.0. Descriptive statistical analysis were performed and the data were presented in tables and charts. The inclusion and exclusion criteria of the study patients were as follows:

Inclusion criteria:

1. Age(years) : ≥ 15
2. Patients diagnosed with LBP for orthopedic causes
3. Attending at OPD

Exclusion criteria:

1. Age(years): below 15
2. Patients with non-orthopedic causes of LPB
3. Unwilling to participate in the study

RESULT

Table-1: Distribution of socio-demographic characteristics of the study subjects (N=300)

Variables	Frequency	Percent
Respondent Age		
< 15	45	15.00
15-30	29	9.67
31-40	70	23.33
41-50	42	14.00
51-60	89	29.67
61-70	28	6.67
Total	300	100

Mean age (years)	46.9 ± 2.57	
Sex		
Male	124	41.33
Female	176	58.67
Total	300	100
Residential Status		
Urban	232	77.4
Rural	68	22.6
Total	300	100
Educational Qualities		
Primary Level	8	2.7
SSC	39	12.9
HSC	73	24.2
Graduation	135	41.9
Post-Graduation	32	10.7
Others	23	7.7
Total	300	100
Employment Status		
Government Employee	86	28.5
Teacher	37	12.4
Self-Employed	21	7.0
Others	13	4.3
Farmer	24	8.1
Businessman	119	39.7
Total	300	100
Socio-Economic Status		
Upper	205	68.3
Middle	58	19.4
Lower	37	12.3
Total	300	100
Smoking		
Yes	216	72.0
No	84	28.0
Total	300	100

Table 1 provides an overview of the socio-demographic characteristics of the study participants. The mean age of the patients was 46.9 ± 2.57 years. The most common age group was 51-60 years, comprising 89 (29.67%) patients, followed by the 31-40 years group with 70 (23.33%), less than 15 years with 45 (15.00%), and 41-50 years with 42 (14.00%) patients. The majority of the patients were females (176, 58.67%). Most patients (232, 77.4%) were from urban areas, while 68

(22.6%) were from rural areas. In terms of educational attainment, the majority had a graduation-level education, 135 (41.9%), followed by HSC 73 (24.2%) and SSC 39 (12.9%). Regarding employment status, the majority were businessmen, 119 (39.7%), followed by government employees, 86 (28.5%), and teachers, 37 (12.4%). Socio-economically, most patients belonged to the upper class, 205 (68.3%). The most frequent 216 (72%) patients reported smoking.

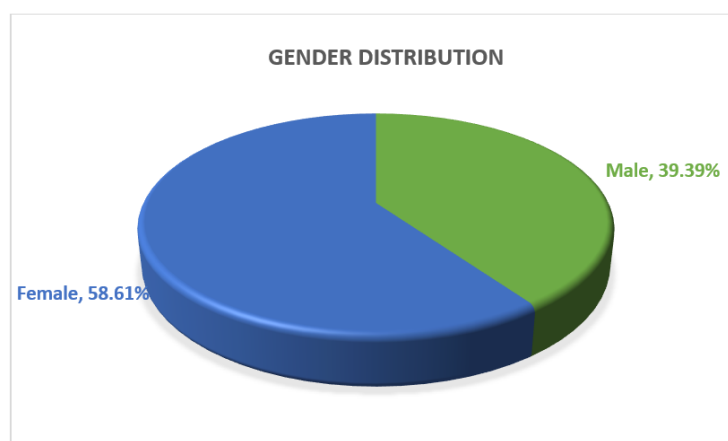


Fig-1: Shows the gender distribution of the study patients(N=186)

Table-2: Distribution of associated diseases with the study subjects (N=300)

Comorbidity	Frequency	Percent
Diabetes Mellitus (DM)	192	30.6
Hypertension (HTN)	136	45.2
Chronic Kidney Diseases (CKD)	84	28.0
Cardiovascular Disease (CVD)	31	10.2
Thyroid	13	4.3
Toxic Goiter	3	1.1
Musculoskeletal Disorder	8	2.7
Osteoarthritis of the Knee	48	16.1
Osteoarthritis of the Hip	16	5.4
Cervical Spondylosis	26	8.6
Rotator Cuff Syndrome	11	3.8
Osteoarthritis of the Shoulder	8	2.7
Neglected Club Foot	5	1.6
Total	300	100

Table 2 highlights the comorbidity results of the study patients. Hypertension (HTN) was the most prevalent comorbidity, present in 136 (45.2%) patients, followed by Diabetes Mellitus (DM) in 92 (30.6%) and chronic kidney disease (CKD) in 84 (28.0%).

Cardiovascular diseases (CVD) affected 31 (10.2%) patients, and musculoskeletal disorders like osteoarthritis of the knee were present in 48 (16.1%) patients.

Table: 3-Distribution of etiological status of low back pain among the study subjects (N=300)

Variable	Frequency		
Etiological Status	Acute (n)(%)	Sub-acute(n)(%)	Chronic(n)(%)
Mechanical			
Spondylosis	65 (21.7)	20 (6.7)	45 (15.0)
Disc prolapse	56 (18.7)	18 (6.0)	48 (16.0)
Spondylolisthesis	35 (11.7)	16 (5.3)	29 (9.7)
Back strain	48 (16.0)	21 (7.0)	40 (13.3)
Sacroiliac Joint sprain	14 (4.66)	6 (2.0)	9 (3)
Spinal stenosis	10(3.33)	5(1.66)	7(2.33)
Infection			
Epidural abscess	6 (2.0)	2 (0.7)	5 (1.7)
Septic diskitis	5 (1.7)	2 (0.7)	3 (1.0)
Neoplastic			
Lesion	5 (1.7)	2 (0.7)	3 (1.0)
Primary	3 (1.0)	2 (0.7)	2 (0.7)
Inflammatory			
Spondyloarthritis	1 (0.33)	0 (0.0)	2 (0.7)
Non-specific	1(0.33)	0	0(0)

Table 3 summarizes the etiological status of low back pain (LBP) among the study patients. Among the patients with mechanical pain, spondylosis was the most frequent cause, observed in 130 (43.33%) cases, which included acute pain in 65 (50%), sub-acute in 20 (15.38%), and chronic in 45 (34.61%). Disc prolapse accounted for 122 (40.67%) cases, with 56 (45.90%) acute, 18 (14.75%) sub-acute, and 48 (39.34%) chronic presentations. Other notable mechanical causes included back strain (109 cases, 36.33%), spondylolisthesis (80 cases, 26.67%), sacroiliac joint sprain (29 cases, 9.67%), and spinal stenosis (22 cases, 7.33%). For infection-

related causes, epidural abscess and septic diskitis contributed to 11 cases (3.67%) combined, with 6 (54.55%) acute, 2 (18.18%) sub-acute, and 5 (27.27%) chronic cases. Among neoplastic causes, there were 8 cases (2.67%) of lesion and primary tumors, with 5 (62.5%) acute, 2 (25.0%) sub-acute, and 3 (37.5%) chronic cases. Inflammatory causes, including spondyloarthritis and non-specific pain, were rare, contributing only 2 cases (0.67%), with 1 (50%) acute and 2 (50%) chronic cases. Chronic presentations were the most frequent across all etiological categories.

Table-4: Distribution of the study patients by required treatment (N=300)

Variable	Frequency	Percent
Referred for surgery	31	10.3
Treated by non-surgical procedures	269	89.7
Total	300	100

Surgical cases (n=31) were excluded from this study.

Table-4 shows the treatment modality of the study patients. On the basis of diagnosis 31(10.3%)

patients were referred for surgery and a total of 269(89.7%) patients were given conservative treat.

Table-5: Distribution of treatment approaches performed on the study subjects (n=269)

Mode of treatment	Frequency	Percent
Medication	103	38.28
Physical Therapy	87	32.34
Life style modification	14	5.20
Massage Therapy	23	8.55
Heat and cold therapy	22	8.17
Total	269	100

Table 5 presents the treatment approaches for LBP. Medication was the most common treatment, utilized by 103 (38.28%) patients, followed by physical

therapy (87(32.34%), life style modification 14(5.20%), massage therapy 23(8.55%), Heat and cold therapy 22(8.17%).

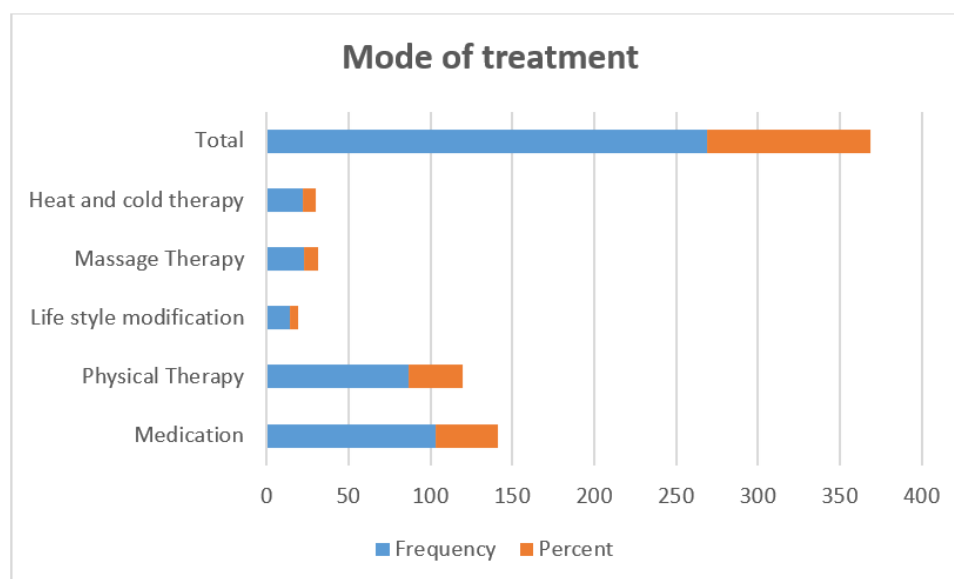


Fig-2: Shows different modes of treatment of the study patients (n=269)

Table-6: Distribution of treatment outcomes of the study subjects at 3 and 6 month (N=269)

Outcomes at 3 months	Frequency (n=269)	Percent (%)
Recovered	131	48.4
Improved	121	34.9
Stable	34	11.3
Referred	13	5.4
Total	269	100
Outcomes at 6 months	Frequency (n=256)	Percent %
Recovered	144	56.25
Improved	96	37.5
Stable	13	5.07
Referred	3	1.17
Total	256	100

Table-6 presents the outcomes of patients at 3 and 6 months, highlighting their recovery status based on frequency and percentage. At 3 month, 131(48.4%) patients had recovered, 121 (34.9%) patients showed improvement, 34(11.3%) patients remained stable, and 13(5.4%) patients were referred. At 6 month, percentages of recovery were improved up to 144(56.25%), 96 (37.5%) patients improved their condition, 13(5.07%) patients remained stable, and 3(1.17%) patients were referred for better treatment to another center. These findings suggest changes in patient outcomes over time, with an increase in recovery cases and a reduction in referrals and stable cases by the 6-month mark.

DISCUSSION

This study provides a comprehensive assessment of the socio-demographic characteristics, etiologies, treatment approaches, and outcomes among patients presenting with low back pain (LBP) in tertiary care hospitals in Bangladesh. The mean age of patients was 46.9 years, with the majority in the 41-50 age group. This observation aligns with findings by Lee *et al.*, [13], who reported that LBP prevalence peaks during middle age due to increased exposure to occupational and lifestyle-related stressors. Mechanical causes were the predominant contributors to LBP, with spondylosis (43.33%) and disc prolapse (40.67%) being the most common etiologies. These findings are consistent with global trends, as highlighted by Patel and Sharma [14], who emphasized the prevalence of mechanical factors in both sedentary and physically demanding occupations. The predominance of females (58.6%) in this study is similar to findings by Hossain *et al.*, [15], who identified higher LBP prevalence among women due to biological, hormonal, and sociocultural factors. However, Rahman *et al.*, [16] noted a contrasting trend of male predominance in occupation-specific studies among industrial workers, suggesting that occupational roles play a critical role in determining gender-based prevalence. The urban majority (77.4%) observed in this study can be attributed to better healthcare access and reporting in urban areas compared to rural settings. This urban-rural disparity is also reflected in findings by Chowdhury *et al.*, [17], who emphasized the role of healthcare infrastructure in shaping healthcare-seeking

behavior. Despite conservative treatment being the primary mode of care, non-pharmacological strategies like lifestyle modifications and heat/cold therapy were underutilized. Akhtar *et al.*, [18] highlighted the importance of integrating these approaches into standard care protocols to enhance recovery rates and improve outcomes. The socio-economic status of the participants in this study indicates that individuals with greater resources and higher educational attainment are more likely to seek medical care for LBP. This observation is supported by Gupta *et al.*, [19], who demonstrated that socio-economic status significantly influences healthcare utilization for musculoskeletal disorders. Although less common, rare etiologies such as infections (3.67%) and neoplastic causes (2.67%) were identified, underscoring the importance of thorough differential diagnoses. Roy and Barman [16] emphasized that non-mechanical factors should be carefully considered in atypical or refractory cases. Comorbidities such as hypertension (45.2%), diabetes mellitus (30.6%), and chronic kidney disease (28.0%) were prevalent among LBP patients in this study. Alam *et al.*, [21] similarly highlighted the exacerbating role of metabolic disorders in chronic pain syndromes, emphasizing the need for holistic management strategies. The high smoking rate (72%) among participants represents a critical area for intervention, as smoking has been linked to delayed recovery and worsened musculoskeletal outcomes. Uddin *et al.*, [22] identified smoking as a modifiable risk factor, advocating for its inclusion in comprehensive treatment plans. Begum *et al.*, [23] similarly emphasized smoking cessation as a key intervention for reducing the burden of LBP. This study demonstrated favorable outcomes with conservative treatment, with 56.25% of patients achieving recovery within six months. However, 11.3% of patients required referrals or remained stable, indicating the need for advanced diagnostic and therapeutic modalities tailored to individual needs.

LIMITATIONS OF THIS STUDY

This study has several limitations, including a relatively small sample size and an urban bias, which may limit the generalizability of findings to the broader Bangladeshi population. The cross-sectional design prevents establishing causal relationships, while reliance

on self-reported data introduces the risk of recall bias. Additionally, psychological factors influencing chronic pain were not explored, and cultural aspects affecting health-seeking behavior were overlooked.

CONCLUSION

This study investigated that the majority of the patients suffering from low back pain (LPB) were middle-aged females. Hypertension was the most common associated disease with the study patients. Mechanical causes like spondylosis and disc prolapse were frequent, with varying stages of LBP. Conservative treatment approaches were effective in most cases and most of the patients achieved full recovery, while a significant portion showed improvement. A small number remained stable or required further treatment, highlighting the diverse outcomes and the importance of tailored management strategies.

RECOMMENDATIONS

Future research should focus on larger, more diverse samples, including both urban and rural populations, to ensure broader generalizability. Longitudinal studies with extended follow-up periods would provide better insights into the long-term outcomes of low back pain management. Incorporating advanced diagnostic tools and psychosocial assessments could enhance the accuracy of identifying etiologies and understanding the impact of psychological factors on chronic pain. Additionally, cultural influences on health-seeking behavior and treatment adherence should be explored to develop more effective, context-specific interventions.

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