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Original Research Article

Clinical Patterns and Associated Factors of Chronic Low Back Pain at Bugando Medical Centre, Mwanza, Tanzania

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Abstract: Chronic Low Back Pain (CLBP) is a common health concern worldwide. It is the most prevalent musculoskeletal problem and one of the most common causes of disability in developed nations. This study was conducted to determine the clinical patterns and associated factors of CLBP in patients who are attended at the Orthopaedic Clinic of the Bugando Medical Centre, Mwanza Tanzania in order to assist in designing CLBP preventive measures. This was cross-sectional analytical study conducted between July 2019 and November 2019 in the Orthopaedic Clinic of Bugando Medical Centre and a structured questionnaire was used for data collection. A total of 228 candidates were enrolled in the study. Majority of the candidates were male 141 (61.84%), the mean age of the candidates was 51.8 (±14.2). Two hundred and twenty five (98.68%) candidates had CLBP on exertion with 192 (84.21%) candidates experienced radicular neuropathic pain to the lower limbs. Severity of CLBP was significantly associated ($p< 0.05$) with age group, marital status, occupation, previous back pain, prolonged static work posture, heavy physical work and obesity. All candidates had some functional disability with the majority presenting with moderate functional disability. CLBP mostly affects mostly males in the working age group with majority presenting with pain on exertion and radicular neuropathic pain to the lower limbs. Appropriate measures should be taken to prevent CLBP including ergonomic assessment of the home and work place as well as routine public health promotions on appropriate back postures and uses.

Keywords: Chronic low back pain, clinical patterns, associated factors.

INTRODUCTION

It is estimated that, in all populations, individuals have an 80% probability of having low back pain at some period during their life time, and about 18% of the population experiences low back pain at any given moment [1].

Chronic low back pain (CLBP) has a high morbidity with high social and economic effects. Studies which have been done worldwide show an increase in CLBP Prevalence. This increase in CLBP prevalence is of significant concern because of its substantial social impact and demand for health services [2]. Current treatments are inadequate for many patients. With current therapies, many patients fail to achieve adequate relief for chronic pain [3].

CLBP is the most common musculoskeletal problem encountered in the work place, with attendant loss of quality of life and financial difficulty [4].

This study aimed to determine the clinical presentation patterns and associated factors of chronic low back pain in patients attending the Orthopaedic Clinic at Bugando Medical Centre in order to assist in designing preventive measures for CLBP.

MATERIALS AND METHODS

Study Design and Setting

This was a cross- sectional analytical study conducted between July 2019 and November 2019 at BMC Orthopaedic Clinic of Bugando Medical Centre (BMC) in Mwanza Tanzania.

Study Participants

The sample size was estimated at 228 subjects using the Yamane Taro formula based on from Bugando Medical Centre medical records data where an average of 528 patients were attended monthly at the BMC Orthopaedic Clinic;

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$n= N/[1+N(e)^2]$
Where n= sample size, N= population under the study (528), e= error margin (0.05)

All patients with a complaint of Low Back Pain for more than three months with/without radiculopathy were included in the study. Patients who had congenital deformities of the spine, patients too ill to participate in the study or mentally incapacitated were excluded from the study.
Sampling procedure was convenient.

Recruitment and Data Collection

Patients were informed about the study and requested to voluntarily participate. All patients who met the inclusion criteria signed a written informed consent and were consecutively included until sample size was reached. A structured questionnaire was read to the candidate for data collection. It had three parts; candidate's demographics, clinical history and physical examination and lastly laboratory investigations, results and definitive diagnosis.

For identifying a patient's base line status relative to pain, function and disability; a validated self-report Oswestry low back pain disability questionnaire was used. The Oswestry Disability Index (also known as the Oswestry Low Back Pain Disability Questionnaire) is an extremely important tool that researchers and disability evaluators use to measure a patient's permanent functional disability. It is considered the 'gold standard' of low back functional outcome tools.

Recruitment of patients and data collection was done by the Principal Investigator with assistance of Orthopaedic Surgeons, Residents, Registrars and Physiotherapists from Orthopaedics Department. They evaluated every eligible patient who presented with Low back pain and made definitive diagnosis after relevant diagnostic and laboratory studies.

Due to complexity of the terms used in the questionnaire and in the Oswestry low back pain disability questionnaire, especially when these terms are translated in Swahili, Workable translation and Cross cultural adaptation was done. These were translated to Swahili by 2 translators (both are bilingual, fluent in English, one knowledgeable with medicine another knowledgeable with standard Swahili language).

After a detailed history and clinical examination, all the patients with CLBP underwent urinalysis, full blood count, and erythrocyte sedimentation rate, x-ray of the lumbar sacral spine as baseline investigations.

Advanced imaging studies such as Computed Tomography (CT) and/or Magnetic Resonance Imaging (MRI) of the lumbar spine were used to determine diagnosis in indeterminate or complex cases. All radiological studies were reviewed by a Radiologist.

The detailed history, physical findings, and result of diagnostic and laboratory investigations were documented in each patient's case note.

Data Management and Statistical Analysis

The collected data was entered in Microsoft Excel Worksheet and transferred into STATA version 12 for analysis according to the objectives of the study. Frequency tables, cross tabulation, Fisher's exact test tables and Pearson chi‑square test of significance were used ($p < 0.05$ was considered as statistically significant).

Ethical Consideration

This study was cleared by the Joint CUHAS/BMC Ethics and Review Committee (No. CREC/380/2019). Voluntary written informed consent was signed by every participant prior the involvement into the study. Patient's refusal to consent or withdraw from the study did not alter or jeopardize their access to standard medical care at BMC. Confidentiality was maintained by using anonymous codes throughout the study.

RESULTS

Table 1: Demographic and Social- Economic Characteristics

A total of 228 candidates with CLBP were included in the study, majority (61.84%) of the candidates were males. The mean (standard deviation) age of the candidates was 51.8 (±14.2) years with range of 18 to 87 years. Other details of their characteristics are shown in Table 1 below;

Table-1: Demographic and Social- Economic Characteristics

Variables		Number(n)	Percentage (%)
Sex	Male	141	61.84
	Female	87	38.16
Age	Mean	51.8±14.2	-
	Range	18 - 87	-
Age group	< 60	169	74.12
	≥ 60	59	25.88
Marital Status	Single	28	12.28
	Married	189	82.89
	Divorced	2	0.88
	Widow	9	3.95
Source of Referral	Self	109	47.81
	Primary Health Care	53	23.25
	Secondary Health Care	66	28.95
BMI	Not Obese	179	78.51
	Obese	49	21.49
Occupation	Peasant	76	33.33
	Trader	63	27.63
	Mine worker	13	5.70
	Health worker	20	8.77
	Driver	4	1.75
	Teacher	29	12.72
	Student	9	3.95
	Other	14	6.14

Table 2: Clinical Presentation Patterns of CLBP

Two hundred and twenty five (98.68%) candidates presented with CLBP more on exertion. Radicular neuropathic pain to the lower limbs was reported by 192 (84.21%) of candidates. As shown in Table 2 below;

Table-2: Clinical Presentation Patterns of CLBP

Clinical presentation	Number(n)	Percentage (%)
More low back pain on exertion	225	98.68
Radicular neuropathic pain to the lower limbs	192	84.21
Radiculopathy to right lower limb	153	67.11
More back pain when at rest	151	66.23
Radiculopathy to left lower limb	132	57.89
Localized low back pain	23	10.09

Table 3: Risk Factors of CLBP

A number of risk factors for CLBP were studied; pulling/ pushing was the common in all the candidates, awkward bending position was reported by 227 (99.56%) candidates, repetitive lifting by 220 (96.49%) candidates and prolonged static work posture reported by 212 (92.98%) as shown in Table 3 below;

Table-3: Risk Factors of CLBP

Factor	Number(n)	Percentage (%)
Pulling/ Pushing	228	100
Awkward Bending position	227	99.56
Repetitive lifting	220	96.49
Job satisfaction	215	94.30
Prolonged static work posture	212	92.98
Heavy physical works	124	54.39
Vibration	112	49.12
Previous back pain	67	29.39
Obesity	49	21.49
Boredom in work and stress	28	12.33
Smoking	26	11.40
Problem with employer/ colleagues	4	1.75

Table 4: CLBP Patients' Functional Disability

Measuring patient's functional disability; more than half of the respondents 118 (51.75%) had moderate disability, 70 (30.7%) had severe disability, minimal disability was in 27 (11.84%) respondents, and 13 (5.7%) were crippled as shown in Table 4 below;

Table-4: CLBP Patients' Functional Disability

Functional disability	Frequency	Percentage (%)
Minimal disability	27	11.84
Moderate disability	118	51.75
Severe disability	70	30.7
Crippled	13	5.7

Table 5: Factors associated with CLBP according to Functional Disability

Statistically significant factors associated with CLBP functional disability severity were age group, marital status, occupation, previous back pain, prolonged static work posture and heavy physical work and body mass index as shown in Table 5 below;

Table-5: Factors associated with CLBP according to Functional Disability

Factor		Functional Disability				p-value
		Minimal n(%)	Moderate n(%)	Severe n(%)	Crippled n(%)	
Age group (years)	<60	27(15.9)	101(59.8)	37(21.9)	4(2.4)	**<0.001**
	≥60	0(0.0)	17(28.8)	33(55.9)	9(15.3)	
Gender	Female	12(8.5)	72(51.1)	47(33.3)	10(7.1)	0.148
	Male	15(17.2)	46(52.9)	23(26.4)	3(3.5)	
Marital Status	Single	17(60.7)	8(28.6)	3(10.7)	0(0.0)	**<0.001**
	Married	10(5.3)	107(56.6)	62(32.8)	10(5.3)	
	Divorced	0(0.0)	1(50.0)	0(0.0)	1(50.0)	
	Widow	0(0.0)	2(22.2)	5(55.6)	2(22.2)	
Occupation	Peasant	0(0.0)	30(39.5)	37(48.7)	9(11.8)	**<0.001**
	Trader	10(15.9)	34(53.9)	18(28.6)	1(1.6)	
	Mine worker	2(15.4)	11(84.6)	0(0.0)	0(0.0)	
	Health worker	0(0.0)	12(60.0)	8(40.0)	0(0.0)	
	Driver	0(0.0)	3(75.0)	0(0.0)	1(25.0)	
	Teacher	7(24.1)	19(65.5)	2(6.9)	1(3.5)	
	Student	7(77.8)	2(22.2)	0(0.0)	0(0.0)	
	Others	1(7.1)	7(50.0)	5(35.7)	1(7.1)	
Previous back pain	No	25(15.3)	92(57.1)	39(24.2)	5(3.1)	**<0.001**
	Yes	2(3.0)	26(38.8)	31(46.3)	8(11.9)	
Prolonged static work posture	No	6(37.5)	9(56.3)	0(0.0)	1(6.3)	**0.001**
	Yes	21(9.9)	109(51.4)	70(33.0)	12(5.7)	
Heavy physical work	No	20(19.2)	59(56.7)	20(19.2)	5(4.8)	**<0.001**
	Yes	7(5.7)	59(47.6)	50(40.3)	8(6.5)	
Repetitive lifting	No	2(25.0)	4(50.0)	2(25.0)	0(0.0)	0.663
	Yes	25(11.4)	114(51.8)	68(30.9)	13(5.9)	
Awkward Bending position	No	0(0.0)	1(100.0)	0(0.0)	0(0.0)	1.000
	Yes	27(11.9)	117(51.5)	70(30.8)	13(5.7)	
Body Mass Index	Not Obese	27(15.1)	96(53.6)	48(26.8)	8(4.4)	**0.001**
	Obese	0(0.0)	22(44.9)	22(44.9)	5(10.2)	
Smoking	No	20(9.9)	106(52.5)	64(31.7)	12(5.9)	0.119
	Yes	7(26.9)	12(46.2)	6(23.1)	1(3.9)	

DISCUSSION

CLBP was more common in the age group of less than 60 years in this study similar to other studies which reported similar findings in which the commonest age group with CLBP [4, 5, 6]. This may be related to the fact that those aged less than 60 years are in the active working age group involved in excessive occupational and daily activities associated with early productive life. CLBP results in an inability to carry out social activities and it decreases the capability to perform occupational activities since it mostly affects adults of working age [7,8].

In this study, CLBP was more presented by males 141 (61.84%) than females; contrary to those found by other studies [8,9] where CLBP was common in females. These other studies, enrolled patients who from various clinics including obstetrics and gynecology clinics and so they had a general and more female population representation. In our study, we only enrolled patients attending the Orthopaedic clinics. Gender influences on pain and analgesic use have become a topic of tremendous scientific and clinical interest in the past decade. Abundant evidence from recent epidemiologic studies clearly demonstrates that women are at substantially greater risk for many clinical pain conditions, and current human findings indicate greater pain sensitivity among females compared with males for most pain modalities [8].

In the present study, the clinical manifestation of CLBP were; 225 (98.68%) of the candidates had more back pain especially on exertion or during activities, this was in line another study [9] which established manual handling in lifting of patients was the main cause of LBP. Similar findings were also seen in another study by Vandergrift JL *et al*., 2012 [11]. This similarity involves the common physical ergonomics which can lead to awkward bending and twisting as a result may cause disorders in the muscles, tendons and ligaments of the back.

In the current study, sixty seven percent of the candidates presented with CLBP radiating to the right lower limb and 57.89% had pain radiating to the left lower limb. These findings were almost similar to those by Omoke NI *et al*., 2016 [12] in which majority of the patients (57.1%) pain radiated to the lower extremities. Radicular neuropathic pain to the lower limbs in this study was found to be in 192 (84.21%) of the candidates. This was higher than those found by Omoke N *et al*., 2016 [12] who reported 25.7% and Eyichukwu O et al, 2012 [5] reported 32.5%. The neuropathic component of the CLBP can be caused by nociceptive stimulus related to nerve sprouting inside the degenerated vertebral disc, mechanical compression of the nerve root and release of inflammatory mediators by injured disc but with no mechanical involvement [13].

In this cross- sectional study, a number of risk factors were observed in association with CLBP as observed in previous studies [5, 6, 14]. In this study, age of less than 60 years was statistically significant associated with CLBP. Similar findings were reported by Ogunbode AM *et al*., 2013 [6]. Other authors observed that advanced age had significant association with CLBP [14–17]. Majority 169 (74.12%) of the candidates who were enrolled in this study were in the working age group involved in daily activities. In the advanced age group, there is declining resistance capacity to the regular work. In this study, marital status (being married), had statistically significant association with CLBP, this was as well observed in previous studies [18, 19].

The Body Mass Index (BMI) had significant association with CLBP in this study. Similarly, Shiri R *et al*., 2007 [20] observed; being overweight has a significant association with the lumbar sacral radicular pain. The results of the case-control studies have revealed a positive association between increased BMI and lumbar disc herniation among men and women [21]. However, another study done on Sri Lankan adult females demonstrated that being overweight and being underweight are both risk factors for low back pain [22]. Obesity has been reported to influence the propensity of tendon and ligament diseases which can lead to CLBP [14]. Significant CLBP association was also observed in history of previous back pain, prolonged work posture and heavy physical work as reported by previous authors [10,11, 20, 23].

In this study, functional disability was found in all the respondents, this is contrary to another study which found that (65%) of the participants had functional disability [24]. It is as well higher than the reports of other authors who analyzed adults and elderly people with CLBP and observed prevalence ratios between (40%) and (56%) [25, 26]. This difference may be attributed to this study involving only candidates with CLBP who may have developed functional disability already. More than half of the candidates 118 [51.75%) in this study had moderate disability and 70 (30.7%) had severe disability, this is similar with observations by Pimenta *et al*., 2012 [24] but higher compared to that of Walsh *et al.*, 2008 [27].

Study limitations

Limitations noted include recall bias of study candidates and missing data of candidates who were attended in other non-Orthopaedic clinics.

CONCLUSION

CLBP commonly affects males in the working age group with majority presenting with pain on exertion and radicular neuropathic pain to the lower limbs. The significant factors associated with CLBP severity were age group, marital status, occupation, previous back pain, prolonged static work posture, heavy physical work and obesity.

Appropriate measures should be taken to prevent CLBP because of its substantial social impact and demand for health services including ergonomic assessment of the home and work place as well as routine public health promotions on appropriate back postures and uses.

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Conflict of interest

The authors declare no conflict of interest.

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