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ASSOCIATION BETWEEN LEVELS OF PAIN AND DISABILITY IN PATIENTS WITH SOMATIC AND NEUROGENIC LOW BACK PAIN AT MBAGATHI DISTRICT HOSPITAL IN NAIROBI COUNTY, KENYA

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ASSOCIATION BETWEEN LEVELS OF PAIN AND DISABILITY IN PATIENTS WITH SOMATIC AND NEUROGENIC LOW BACK PAIN AT MBAGATHI DISTRICT HOSPITAL IN NAIROBI COUNTY, KENYA

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ABSTRACT

Background: Low Back Pain is a problem of public health importance in developed countries as well as developing ones including Kenya. Low Back Pain, sub-categorized into somatic and neurogenic pain manifests in different unknown levels which have enormous health and socio economic impact. In Kenya, information on levels of pain and disability and how the two affect each other remain scanty.

Objective: To determine the relationship between levels of pain and disability among patients with somatic and neurogenic Low Back Pain at Mbagathi District Hospital in Nairobi County, Kenya.

Design: A cross-sectional study.

Setting: Mbagathi District Hospital from May 2016 to August 2016.

Subjects: All consenting Low Back Pain patients referred for out-patient physiotherapy clinic at Mbagathi District Hospital

Results: Out of 176 participants enrolled in the study, majority, (63.1%) were females compared to 36.9% who were males. The proportion of patients with somatic Low Back Pain was 72.7 % (n=128) compared to 27.3 % (n=48) that had neurogenic Low Back Pain. More than half, 55.7 % (n=98) of the participants had pain intensity of moderate level while the remainder, 44.3 % (n=78) presented with severe pain level. Most respondents, 60.8 % (n=107) had minimal disability level compared to 33.5 % (n=59), and 5.7 % (n=10) whose levels were moderate and severe disability respectively. Results showed significant association between severe pain and moderate and severe disability ($P < 0.001$). Neurogenic pain was also significantly associated with severe and moderate disability ($P = 0.006$).

Conclusion: A great majority of patients attending out-patient physiotherapy clinic presented with somatic Low Back Pain whose disability level was Minimal. A smaller

proportion of patients with neurogenic Low Back Pain had moderate and severe disability. Neurogenic pain posed the highest risk of moderate and severe disability.

INTRODUCTION

Low back pain is pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without sciatica, and is defined as chronic when it persists for 12 weeks or more (1). It is categorized into two types, namely somatic and neurogenic pain. Low Back Pain is one of the most common health problems affecting people (2). It has been found to be a global health dilemma affecting the global economic, social and public health sectors thus increasing and incurring billions of dollars in medical expenditure each year (3).

It is one of the leading causes of physical limitation in the USA and a chief source of incapacitation, suffering and expenses, the medical costs exceeding \$24 billion in 1990 (4). It is the main source of temporary disability affecting population aged below 45 years (5). In the United States of America (USA) and Australia, Low Back Pain is one of the most common problems treated in the Health care System affecting 2-5% of the population at any one time, 26-27% over any 3 month period and 70-80% over the course of their life time (6, 7, 8, 9). In South Africa 80% of the workforce suffers from severe discomfort and disability due to Low Back Pain at some point in their working life (10).

Studies show unexplained and large variations in diagnostic tests and evaluation (1, 11). The 2010 Global Burden of Disease Study ranked low back pain as the condition with the highest number of years lived with disability (YLDs) and sixth in terms of disability-adjusted life years (DALYs) (12,13). Factors found to be associated with neuropathic pain which comprises of 20-35% include older age, female sex, manual occupation, being unable to work, living in a rural area or council-rented accommodation, and lower educational attainment (14).

A study on self-reported pain and disability outcomes showed a significant association between pain and disability and that disability was predicted by sex, pain intensity and leg pain (15). Patients with pain referral to the legs were more severely affected than those whose pain was localized and patients with signs of nerve involvement were the ones most severely affected (16). In Kenya, literature on similar study is scanty.

MATERIALS AND METHODS

This was a cross sectional study design of 176 patients with Low Back Pain with or without leg pain attending physiotherapy clinic at Mbagathi District Hospital in Nairobi County. Patients who were below 18 years and those that did not give consent to participate in the study were excluded. Recruitment into the study was done on a daily basis between 8 am and 2pm for three (3) months until the targeted sample size was attained.

Data Collection Procedure: Data was collected by two research assistants who were always present at the physiotherapy clinic each day during the study period. Those patients who met the inclusion criteria, aged 18 years and above and had given consent to participate, were recruited into the study. A record of all patients with Low Back Pain attending the clinic was kept by principal investigator or the research assistants. Each study participant was identified by a subject identifier number corresponding to the questionnaire. A researcher-administered questionnaire was used to capture information on selected socio-demographic factors while the Self-complete Leeds Assessment of Neuropathic symptoms and Signs (S-LANSS) and Oswestry Disability Index (ODI) were used

to capture data on levels of pain and disability respectively. All the study participants were interviewed until the sample size was attained in readiness for analysis.

Data management and analysis: All filled questionnaires were counterchecked to ensure that all were completed well and to check if there were any missing information. The completed questionnaires were then kept and locked in a secured place to ensure privacy and confidentiality of the participants. Data was entered into Microsoft excel and double data entry was carried out so as to validate the study variables. Once the validation was completed, the data was exported into a Statistical Package for Social Sciences (SPSS-version 19.0) for statistical analysis. The results were presented in proportions and tables. Associations between pain and disability was done using odds ratios (OR) and P-values. P-values ≤ 0.05 were considered significant.

Ethical consideration: Approval to carry out the study was sought from the University of

Nairobi-Kenyatta National Hospital ethics review committee and Mbagathi District Hospital. A written informed consent was obtained from all participants. The study participants were interviewed in the private treatment rooms for privacy and confidentiality.

RESULTS

A total of 176 participants with Low Back Pain were recruited into the study. Out of 176 patients, majority, 63.1 % (n= 111) were females while the males comprised of 36.9 % (n=65). The median age was 40 years, (IQR) 32-48 years. Less than half, 34.1 % (n=60) of the participants were aged between 30-39 years. The most majority of the participants, 95.5 % (n=168) were Christians. Out of the 176 participants, majority, 75.6 % (n=133) were married and the remainder comprised of those that were never married, 22.7 % (n=40), divorced, 1.1 % (n=2) and widowed, 0.6 % (n=1). (Table 1)

Table 1: Socio-demographic characteristics of the respondents

Variable	Frequency (%)
Gender	
Male	65 (36.9)
Female	111 (63.1)
Age group	40(32-48)Median age in years(IQR)
18-29	26 (14.8)
30-39	60 (34.1)
40-49	47 (26.7)
50-59	25 (14.2)
≥ 60	18 (10.2)
Religion	
Christian	168 (95.5)
Muslim	8 (4.5)

Marital status	
Never married	40 (22.7)
Divorced	2(1.1)
widowed	1(0.6)
Married	133 (75.6)
Employment status	
Not working	16 (9.1)
Informal employment	97 (55.1)
Formal employment	63 (35.8)
Income	
<10,000	31 (17.6)
10,000-19,999	52 (29.5)
20,000-29,999	50 (28.4)
30,000-39,999	25 (14.2)
40,000-49,999	15(8.5)
≥50,000	3(1.7)
Education status	
Primary education	22 (12.5)
Post-secondary education	154 (87.5)

Pain type, Pain Intensity and disability levels in patients with Low Back Pain: The proportion of patients with somatic Low Back Pain was 72.7 % (n=128) compared to 27.3 % (n=48) that had neurogenic Low Back Pain. More than half, 55.7 % (n=98) of the participants had pain intensity of

moderate level while the remainder, 44.3 % (n=78) presented with severe pain level. Most respondents, 60.8 % (n=107) had minimal Low Back Pain disability compared to 33.5 % (n=59), and 5.7 % (n=10) whose levels were moderate and severe disability respectively (Table 2).

Table 2: Pain type, pain intensity and the levels of disability in patients with Low Back Pain

Variable	Frequency (%)
Pain type	
Somatic	128 (72.7)
Neurogenic	48 (27.3)
Pain intensity	
Moderate	98 (55.7)
Severe	78 (44.3)
Disability level	
Minimal	107 (60.8)
Moderate	59 (33.5)
Severe	10(5.7)

Association between pain intensity and levels of disability: Majority of participants with severe pain, 70.5 % (n=55) had severe and moderate disability compared to 29.5% who had minimal disability. Out of ninety-eight respondents with moderate pain, 85.7

%(n=84) had minimal disability compared to 14.3% that had severe and moderate disability. This test revealed that severe pain (OR=14.3; 95%CI: 6.8-30.2; p<0.001) was significantly associated with severe and moderate disability (Table 3).

Table 3: Relationship between pain intensity and the level of disability

Variable	Level of disability		OR (95% CI)	P value
	Severe and moderate	Minimal		
Pain intensity				
Moderate	14 (14.3)	84 (85.7)	1.0	
Severe	55 (70.5)	23 (29.5)	14.3 (6.8-30.2)	<0.001*

*significant $p \leq 0.05$

Pain type and level of disability: Neurogenic pain was significantly ($p < 0.001$, OR=20.9) associated with moderate and severe disability as shown in Table 4.

Table 4: Association between pain type and levels of disability

	Disability level		OR (95% CI)	P value
	Severe and moderate	Minimal		
Pain type				
Somatic	28 (21.9)	100 (78.1)	1.0	
Neurogenic	41 (85.4)	7 (14.6)	20.9 (8.5-51.7)	<0.001*

*Significant $p \leq 0.05$

Association between pain type and disability level stratified by socio-demographic characteristics: This analysis was carried out to control for confounding and this was done for the selected socio-demographic characteristics. In gender, neurogenic pain in both male and female had a significant association with severe and moderate disability ($p < 0.001$) but the 95%CI were overlapping.

In age groups apart from ≥ 60 years being marginally significant ($p > 0.058$), the rest were statistically significant ($p < 0.05$) in neurogenic pain with severe and moderate

disability level though the strata were also overlapping. Being 30-39 years old revealed a higher risk (OR=33) of severe and moderate disability in patients with neurogenic pain compared to somatic pain. Other strata that were significant are religion (Christians), Marital status (married and unmarried), employment status (informal and formal), all income categories, and post-secondary education were statistically significant ($P < 0.05$) and therefore associated with severe and moderate level of disability. In this analysis neurogenic pain was consistently significant (Table 5).

Table 5: Association between pain type and disability level stratified by socio-demographic characteristics

Variable		Pain type	Disability level		OR (95% CI)	Fisher's Exact test P value	Mantel-Haenszel test	
			Severe and moderate	Minimal			OR (95% CI)	P value
Gender	Male	Somatic	9 (18.4)	40 (81.6)	1.0	<0.001*	21.0 (8.5-52.3)	<0.001*
		Neurogenic	13 (81.3)	3 (18.8)	19.3 (4.5-82.0)			
	Female	Somatic	19 (24.1)	60 (75.9)	1.0	<0.001*		
		Neurogenic	28 (87.5)	4 (12.5)	22.1 (6.9-71.1)			
Age group	18-39	Somatic	12 (19.0)	51 (81.0)	1.0	<0.001*	20.6 (8.2-51.8)	0.001*
		Neurogenic	20 (87.0)	3 (13.0)	28.3 (7.2-111.1)			
	40-59	Somatic	13 (23.6)	42 (76.4)	1.0			
		Neurogenic	15 (88.2)	2 (11.8)	24.2 (4.9-120.2)	<0.001*		
	≥60	Somatic	3 (30.0)	7 (70.0)	1.0	0.069		
		Neurogenic	6 (75.0)	2 (25.0)	7.0 (0.9-56.9)			
Religion	Christian	Somatic	25 (20.7)	96 (79.3)	1.0	<0.001*	22.4 (8.6-56.2)	<0.001*
		Neurogenic	40 (85.1)	7 (14.9)	21.9 (8.8-54.8)			
	Muslim	Somatic	3 (42.9)	4 (57.1)	-	0.285		
		Neurogenic	1 (100.0)	0	-			
Marital status	Not married	Somatic	8 (25.8)	23 (74.2)	1.0	<0.001*	21.4 (8.6-53.2)	<0.001*
		Neurogenic	11 (91.7)	1 (8.3)	31.6 (3.5-285.3)			
	Married	Somatic	20 (20.6)	77 (79.4)	1.0	<0.001*		
		Neurogenic	30 (83.3)	6 (16.7)	19.3 (7.0-52.6)			
Employment status	Not working	Somatic	5 (35.7)	9 (64.3)	-	0.086	23.5 (9.2-59.7)	<0.001*
		Neurogenic	2 (100.0)	0	-			
	Informal employment	Somatic	16 (22.5)	55 (77.5)	1.0			
		Neurogenic	22 (84.6)	4 (15.4)	18.9 (5.7-62.9)	<0.001*		
	Formal employment	Somatic	7 (16.3)	36 (83.7)	1.0	<0.001*		
		Neurogenic	17 (85.0)	3 (15.0)	29.1 (6.7-126.8)			
Income	>10,000	Somatic	5 (20.0)	20 (80.0)	1.0	0.003*	21.1 (8.5-52.6)	<0.001*
		Neurogenic	5 (83.3)	1 (16.7)	20.0 (1.9-211.9)			
	10,000-19,999	Somatic	9 (23.1)	30 (76.9)	1.0			
		Neurogenic	11 (84.6)	2 (15.4)	18.3 (3.4-98.4)			
	20,000-29,999	Somatic	7 (20.0)	28 (80.0)	1.0	<0.001*		
		Neurogenic	12 (80.0)	3 (20.0)	16.0 (3.5-72.6)			
	30,000-50,000	Somatic	7 (24.1)	22 (75.9)	1.0	<0.001*		
		Neurogenic	13 (92.9)	1 (7.1)	40.9 (4.5-370.5)			
Education status	Primary	Somatic	5 (27.8)	13 (72.2)	-	0.008*	22.3 (8.8-56.1)	<0.001*
		Neurogenic	4 (100.0)	0	-			
	Post-	Somatic	23 (20.9)	87 (79.1)	1.0			

	secondary	Neurogenic	37 (84.1)	7 (15.9)	19.1 (7.5-48.4)	<0.001*		
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*significant, $p \leq 0.05$

DISCUSSION

This study sought to determine the levels of pain and disability in patients with somatic and neurogenic low back pain at Mbagathi District Hospital in Nairobi County. Findings from this study indicated majority (72.7%) of the study participants had somatic Low Back Pain compared to 27.3% that had neurogenic Low Back Pain. More than a half (55.7%) reported moderate pain on Visual Analogue Scale (VAS), while less than a half (44.3%) reported severe pain. These findings were similar to studies done on the burden of neuropathic pain which showed that patients with high Neuropathic Pain Scale or Visual Analogue Scale (≥ 6) reported severe or moderate pain or greater pain intensity (15,16,17,18).

A higher proportion of patients reported minimal disability (60.8%) followed by a small proportion that reported moderate disability (33.5%). The least reported severe disability (5.7 %). These findings were similar to studies that were done in developed countries (19, 20). The differences in proportions could be attributed to pain intensity whereby those that had moderate pain had moderate to minimal disability compared to those that had severe pain. Other factors could be due to differences in races and/tribes, pain thresholds and pain levels may have been controlled.

Results from this study indicated that there exists an association exists between pain intensity (severe pain) and levels of disability (moderate and severe). These findings agreed with a study of Korean adults with a mean age of 40 years (21) which found that the degree of disability from Low Back Pain was influenced by pain intensity. The same study revealed that the degree of disability was reported to be

influenced by pain type. This was demonstrated in the risk whereby those patients with severe pain were 14.1 times at risk of suffering severe and moderate disability compared to those that had moderate pain.

In establishing association between pain type and disability level, stratified by socio-demographic factors, neurogenic pain consistently remained the variable with the highest risk of suffering moderate and severe disability in every stratum. The explanation for all participants whose total score was 12 or more, and reported as positive for neurogenic pain was perhaps attributed to presence of peripheral nerve sensitization and central sensitization, high pain intensity and presence of leg pain (15, 16, 22, 23).

Another study on sub-classification of low back-related leg pain showed that those patients who had peripheral nerve sensitization had severe disability compared to those that had central sensitization and denervation (24). Therefore severe and moderate disability group in this study may have been as a result of peripheral nerve sensitization.

In conclusion the study found out that majority of patients attending Mbagathi physiotherapy clinic in Nairobi County were suffering from somatic Low Back Pain whose disability level was minimal. However, the smaller proportion that had neurogenic pain, suffered severe and moderate disability representing greater disability. Consequently, participants with neurogenic LBP pain were at a higher risk of suffering moderate and severe disability compared to those with somatic LBP.

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