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Correlates and Predictors of Low Back Pain Disability and its Impact on Health-Related Quality of Life in a Family Practice Clinic in Calabar, South- South Nigeria

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Abstract

Background: Non-specific low back pain is a common health problem incurring immense health and social costs with concomitant disability, which has assumed significant public health importance in our setting. The impact from this condition is multi-factorial, and includes pain, activity limitations and impairment of quality of life. This study therefore aimed to examine the level of low back pain disability, its correlates and predictors, and the impact on self-perceived quality of life. It also sought to determine the predictors of health-related quality of life among low back pain patients in a Family Practice setting in Calabar, Nigeria.

Method: This was a cross-sectional analytical study involving 350 consecutively selected patients with non-specific low back pain. Standardized questionnaires were used including: the Oswestry Disability Index (ODI) questionnaire, the 12-item General Health Questionnaire (GHQ-12), the Short-form 36 (SF-36) questionnaire and the Visual Analogue Pain Scale. These were used to assess low back pain disability, psychological distress, health-related quality of life and pain intensity respectively.

Result: The mean age of the respondents was 36.16 ± 9.93 years. Majority (70.6%) were females and had chronic pain lasting more than three months. Most of the respondents (88.9%) characterized their pain as severe. The mean health-related quality of life score was 45.82 ± 4.3. Factors associated with severe disability were: psychological distress and pain intensity. Significant correlations were observed between disability, pain intensity and psychological distress using Pearson's correlation analysis. Independent risk factors for disability were psychological distress and those with chronic pain lasting more than 3 months. Overweight and obese subjects were more likely to have poor health-related quality of life when compared with those with normal body mass index (X_2=8.81, P<0.05). The significant predictors of poor health-related quality of life using logistic regression were overweight/obesity and those with severe disability.

Conclusion: This study identified significant correlations between low back pain disability, pain intensity and psychological distress. These correlations could be informative and should guide family physicians in the management of the index problem in our environment. The perception of quality of life in individuals with low back pain should also raise awareness of issues connected to the problem and encourage more research into this area.

Keywords: Low back pain; Health; Multi-factorial pain syndrome; Primary care

Introduction

Low back pain (LBP) is defined as "pain and discomfort localised below the costal margin to the inferior gluteal folds with or without sciatica as viewed from the rear" [1]. Non-specific low back pain is a diagnosis of exclusion, where pain caused by suspected or confirmed serious pathology ("red flag" conditions such as: tumour, infection, and trauma) has been ruled out. In most cases, LBP is benign and resolves within 6 weeks.

However, approximately 20% of individuals with this condition do not show any improvement in their condition, which may progress to chronic LBP that persists over 3 months and is difficult to manage [2].

Low back pain patients suffer from functional limitations that might cause disability and impairments in self perceived quality of life. It can cause severe debilitating pain leading to loss of productivity and is a common cause of disability [1,3].

Low back pain affects every sphere of an individual's life with biopsychosocial repercussions. Psychological and social factors have been shown to predict outcome in chronic LBP [4]. Disability is influenced not only by the underlying physical impairment, but also by the patient's attitudes and beliefs, psychological distress and type of employment. Functional disability is defined as limitation in daily activities and in the fulfilment of regular roles of daily life [5]. Physical factors such as the functional status as well as psychological factors also seem to determine health-related quality of life (HRQOL).

The quality of life of LBP patients is predicted by disability [6]. Quality of life is defined by the World Health Organization as "an

individual's perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" [7]. The HRQOL is a multidimensional concept based on a holistic understanding of health and depicts the ability to function from the subjective view of the individual. It measures the impact a health condition has on the sufferer.

It is an important measure of the well-being and health status of a population [7]. Low back pain is a common and important reason for consultation with the Family physician, and has an important impact on the performance of daily tasks in individuals who present with the condition.

Early identification of clinical, psychosocial and professional factors is important to prevent the progression to chronic LBP. There is need to view LBP as a multi-factorial pain syndrome. Disability from LBP is the expressed combination of physical impairment and psychosocial factors. A shift in clinical focus from symptomatic management to the prevention of disability is needed among Primary care physicians involved in LBP management.

This study sought to determine the level of disability among patients having LBP, as well as the predictors of disability and HRQOL among selected LBP patients. It also sought to establish the relationship between psychosocial variables and disability.

Materials and Methods

Study site

This study was conducted at the Family Medicine Clinic of the University of Calabar Teaching hospital (UCTH), Calabar, in the South-South geo-political region of Nigeria. The Clinic offers primary care services and most patients with LBP are first seen here. Patients are triaged and managed by Family physicians while those requiring specialist care are referred to other specialty clinics within the health facility.

Study population

The participants in the study were selected from patients attending the Clinic with the primary complaint of LBP. Three hundred and fifty consenting subjects aged 18 to 65-years were recruited over 3 months. Those excluded were patients who were very ill, and patients with "red flag" signs or symptoms that are frequently associated with LBP from specific causes.

Study design

This was a hospital-based analytical cross-sectional study.

Sampling method

A purposive sampling method was used where eligible respondents were consecutively recruited from attending patients with the primary complaint of LBP.

Procedure

Every eligible subject was interviewed and a thorough physical examination carried out in consulting rooms that ensured adequate privacy. During the physical examination, the subjects were examined in three positions: standing, sitting and supine.

The examination included visual inspection of the back for obvious abnormalities. Posture, gait and range of movement including the Schober's test were also evaluated, with palpation of the vertebral spine, straight leg raising test (SLRT) and neurological assessment (assessment of muscle tone, reflexes and sensation).

Abnormal clinical findings were documented. Subjects were weighed in kilograms using a calibrated Hanson bathroom scale; and height was measured in metres using a standard height measuring stadiometer. The body mass index (BMI) was calculated using the formula: weight (kg)/height (m)^2.

Interviewer administered questionnaires were used to obtain data for the study. The assessment protocol was carried out by the researchers. Information on the socio-demographic, physical, lifestyle and clinical characteristics of the subjects were obtained using a structured questionnaire. Standardized instruments used were: The Oswestry disability index, the 12-item General health questionnaire version, Short-form 36 questionnaire for HRQOL, and the visual analogue pain scale, which are all validated tools.

Data analysis

Data collected was entered into Microsoft excel, cleaned and checked for errors. It was then analysed using the Statistical Package for Social Sciences (SPSS) version 15 software. Descriptive statistics were employed to summarize the demographic data, which were presented using tables and expressed as: frequencies, percentages, means and standard deviations.

The chi-square test was used to determine associations between categorical data. Binary logistic regression was used to determine predictor variables, while Pearson's correlation analysis was used to demonstrate the relationship between 2 quantitative variables. The level of significance was set at 0.05.

Ethical considerations

Permission to conduct the study was obtained from the Head, Department of Family Medicine and the Health Research and Ethics Committee of the UCTH, Calabar. Privacy and confidentiality of the subjects were maintained during the study. A written informed consent was formally obtained from each subject before enrolment in the study.

Results

The association between socio-demographic and other characteristics with HRQOL of the respondents are presented in Table 1. Obese and overweight subjects were more likely to have poor HRQOL compared to their normal weight counterparts (p=0.003). Similarly, the presence/recurrence of pain within 12 months, presence of co-morbidities and sedentary lifestyle were found to be significantly associated with poor HRQOL (p<0.05).

Table 2 shows the association of the studied characteristics with disability. A significantly higher proportion of subjects with poor mental health status were more likely to suffer severe disability compared to those with good mental health (p=0.01). Subjects with poor HRQOL were also more likely to have severe disability (0.006).

Characteristics	Poor	Good	Test statistic	p-value
	n=302 (86.3%)	n=48 (13.7%)		
Age (years)				
≤ 36	143 (85.6)	24 (14.4)		
>36	159 (86.9)	24 (13.1)	0.12	0.73
Sex				
Male	86 (83.5)	17 (16.5)		
Female	216 (87.4)	31 (21.6)	0.96	0.33
Marital status				
Married	187 (85.4)	32 (14.6)		
Not married	115 (87.8)	16 (12.2)	0.4	0.53
Employment status				
Employed	95 (86.4)	15 (13.6)		
Unemployed	207 (86.3)	33 (13.7)	0.001	0.98
Level of education				
Less than secondary	40 (90.9)	4 (9.1)		
>secondary	262 (85.6)	44 (14.4)		0.48
BMI				
Normal	138 (80.7)	33 (19.3)		
Overweight/obese	164 (91.6)	15 (8.4)	8.81	0.003
Presence of pain				
Yes	94 (94.0)	6 (6.0)		
No	208 (85.2)	42 (16.8)	7.04	0.008
Co-morbidities**				
Present	25 (100)	0 (0)		
Absent	277 (85.2)	48 (14.8)		0.034
GHQ				
Good	133 (86.9)	20 (13.1)		
Poor	169 ((85.8)	28 (14.2)	0.09	0.76
Engaging in physical activity				
Daily/often	267 (85.0)	47 (15.0)		
Rarely/not at all	35 (97.2)	1 (2.8)		0.042
Cigarette smoking**				
Yes	8 (88.9)	1 (11.1)		
No	294 (86.2)	47 (13.8)		1

Table 1: Association between socio-demographic and clinical characteristics, mental status and HRQOL.

Characteristics	Mild/mod	Severe	Total	Test statistic	p-value
	n=216 (62%)	n=134 (38%)	N=350		
Age (years)					
≤ 36	101 (60.5)	66 (39.5)	167 (100)		
>36	115 (62.8)	68 (37.2)	183 (100)	0.21	0.65
Total	216 (61.7)	134 (38.3)	350 (100)		
Sex					
Male	158 (64.0)	89 (36.0)	247 (100.0)		
Female	58 (56.3)	45 (43.7)	103 (100.0)	1.8	0.18
Total	216 (61.7)	134 (38.3)	350 (100)		
Marital status					
Married	132 (60.3)	87 (39.7)	219 (100)		
Not married	84 (64.1)	47 (35.9)	47 (100)	0.52	0.47
Employment status					
Employed	72 (65.5)	38 (34.5)	110 (100)		
Unemployed	144 (60.0)	96 (40.0)	240 (100)	0.95	0.33
Total					
BMI					
Normal	100 (58.5)	71 (41.5)	171 (100)		
Overweight/obese	116 (64.8)	63 (35.2)	179 (100)	1.48	0.22
Presence of pain					
Yes	69 (69.0)	31 (31.0)	100 (100)		
No	147 (58.8)	103 (41.2)	250 (100)	3.15	0.076
Co-morbidities					
Present	18 (72.0)	7 (28.0)	25 (100)		
Absent	198 (60.9)	127 (39.1)	325 (100)	1.21	0.27
GHQ					
Good	106 (69.3)	47 (30.7)	153 (100)		
Poor	110 (55.8)	87 (44.2)	197 (100)	6.59	0.01
Engaging in physical activity					
Daily/often	197 (62.7)	117 (37.3)	314 (100)		
Rarely/not at all	19 (52.8)	**17 (47.2)**	36 (100)	1.36	0.24
Cigarette smoking**					
Yes	4 (44.4))	5 (55.6)	9 (100)		
No	212 (62.2)	129 (37.8)	341 (100)		0.31
Total					

HRQOL					
Good	21 (43.8)	27 (56.3)	48 (100)		
Poor	195 (64.6)	107 (35.4)	302 (100)	7.6	0.006
Total					

Table 2: Association between studied attributes and disability.

Table 3 shows the association between pain intensity, mental status, disability and HRQOL. A significant association was seen between pain intensity and poor mental status as more subjects with severe pain intensity, were likely to have poor mental health status (p=0.0001).

Characteristics	Good	Poor	Total	Test statistic	p-value
	n=153 (44%)	n=197 (56%)	N=350 (100%)		
Intensity of pain		**Mental status**			
Mild/moderate(≤ 6)	76 (56.3)	59 (43.7)	135 (100)	14.14	<0.0001
Severe (>6)	77 (35.8)	138 (64.2)	215 (100)		
Total	153 (43.7)	196 (56.2)	350 (100)		
Disability					
Intensity of pain	Mild/mod	Severe			
Mild/moderate	91 (67.4)	44 (32.6)	135 (100)	3.02	0.08
Severe	125 (58.1)	90 (41.9)	215 (100)		
Total					
HRQOL					
Intensity of pain	GOOD	POOR			
Mild/moderate	13 (9.6)	122 (90.4)	135 (100)	3.02	0.08
Severe	35 (16.3)	180 (83.7)	215 (100)		
Total	48 (13.7)	302 (86.3)	350 (100)		

Table 3: Association between intensity of pain, mental status, disability and HRQOL.

Table 4 shows the predictors of disability among the subjects. The significant predictors of severe disability were those with poor mental health status (odds ratio (OR) 3.93 (95% confidence interval (CI)=3.60-9.93)), those with chronic pain (OR 1.18; 95% CI=1.14-2.83)). Those with good HRQOL were less likely to have severe disability (OR 0.21; CI=1.16-4.18)). Level of significance was set at p<0.05.

Independent Variable	Odds ratio	95% confidence interval	p- value
Pain			
Yes	1.4	0.84-2.35	0.2
No	1		
GHQ			
POOR	3.93	3.60-9.93	0.023
GOOD	1		

Duration of Pain			
>12 weeks	1.18	1.14-2.83	0.011
≤ 12 weeks	1		
HRQOL			
Good	0.21	1.16-4.18	0.015
Poor	1		
Pain intensity			
Severe	0.77	0.48-1.24	0.287
Mild/moderate	1		
Sex			
Female	1.53	0.93-2.50	0.09
Male	1		

Table 4: Predictors of disability among the respondents.

Table 5 shows the predictors of HRQOL among the subjects. The significant predictors of poor HRQOL included being overweight or obese (OR 4.2; CI=2.4-8.17) and those with severe disability (OR 2.23; CI=1.16-4.29).

Independent Variable	Odds ratio	95% confidence interval	p- value
Sex			
Female	0.8	0.40-1.60	0.796
Male	1		
Physical activity			
Yes	4.65	0.95-36.9	0.15
Rarely/none	1		
Pain			
Yes	0.48	0.21-1.82	0.48
No	1		
BMI			
Overweight/Obese	4.2	2.14-8.17	0.01
Normal	1		
GHQ			
POOR	0.98	0.51-1.88	0.96
GOOD	1		
Duration of Pain			
≤ 12weeks	1.21	0.65-2.38	0.52
>12 weeks	1		
Disability (ODI)			
Severe	2.23	1.16-4.29	0.016

Mild/mod	1		
Job satisfaction			
No	1.1		
Yes	1	0.46-2.64	0.82

Table 5: Predictors of HRQOL among respondents.

Table 6 shows the correlation between disability, pain intensity, mental status and HRQOL. A significant association was found between disability and HRQOL, with a weak negative correlation (r=-0.24). A weak positive correlation (r=0.28) was found between pain intensity and disability while a moderate positive correlation (r=0.40) was found between disability and mental health. These relationships were however significant with p<0.05.

Characteristics		Pearson's correlation coefficient	p-value	Total	
Disability	HRQOL	-0.24	<0.0001	350	Weak negative association
Pain intensity	Disability	0.28	<0.0001	350	Weak positive association
Disability	Mental health	0.4	<0.0001	350	Moderate positive association

Table 6: Correlation analysis.

Figure 1 shows the level of disability among the subjects. A higher proportion (58%) of the subjects had moderate disability and this was followed by severe disability (33.7%). The mean Oswestry score was 38.52 ± 12.2.

Figure 2 shows the mental health status of the subjects, with a higher proportion (56.3%) having poor mental health status.

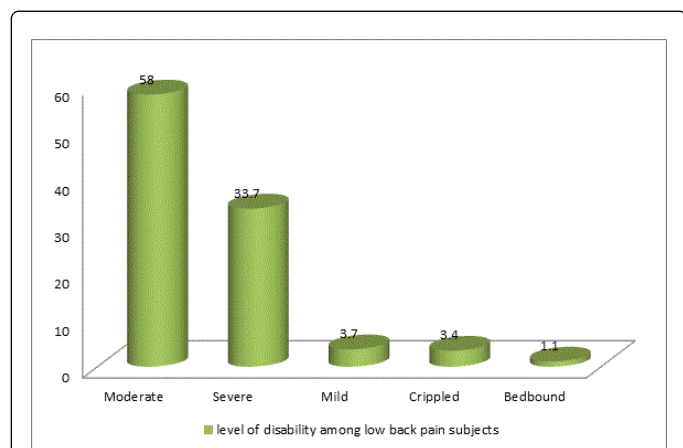Figure 3 shows the HRQOL of subjects. Majority of the subjects (86.3%) had poor HRQOL.

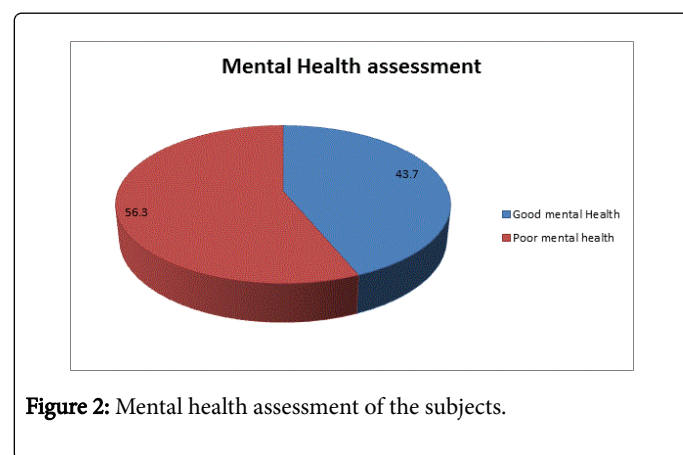**Figure 2:** Mental health assessment of the subjects.

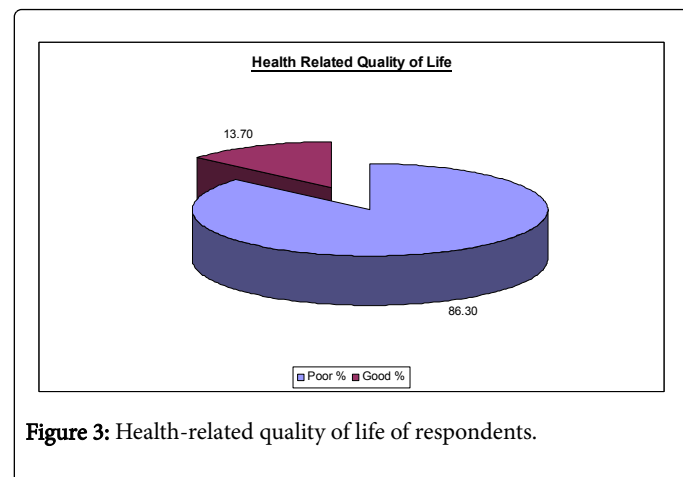**Figure 1:** Level of disability among the subjects.

Figure 3: Health-related quality of life of respondents.

Health-related quality of life of respondents.

Mean score HRQOL=45.82 ± 4.3

Mean physical component =42.95 ± 6.83

Mean mental component =48.6 ± 6.25

Discussion

This study sought to identify the relevance of bio-psychosocial factors in the management of LBP. It also assessed the effect of certain factors on LBP disability and HRQOL. The majority of the subjects in this study were females. There is substantial evidence from epidemiological studies that women are at much greater risk for many clinical pain conditions including LBP [8,9]. Furthermore, it has been reported that there is greater pain sensitivity among females compared with males for most pain modalities [8]. Differences in responsiveness to pain interventions have also been observed [9]. It is well established that sex differences in pain exists. However, the specific underlying mechanisms contributing to this disparity are not clear.

The mean level of disability in this study based on the Oswestry disability index (ODI) was 38.52 ± 12.2. All subjects reported some form of disability but a little more than half reported moderate levels of disability. The present study, reports that subjects with psychological distress were more likely to suffer severe disability. This is in agreement with several other studies which have shown that psychological factors have an important role to play in low back pain disability [10-12]. One study found a close relationship between LBP and depression, and suggested that depression may be an underlying cause of LBP in many cases [12]. A moderate positive correlation (r=0.40) was observed between psychological distress and disability in the index study. The poorer the mental health status, so also did the disability index increase. This relationship was significant, with p<0.05.

A weak negative correlation was observed between disability and HRQOL. This relationship was statistically significant (p<0.05). Also, poor HRQOL was found to be significantly associated with severe disability. This agrees with studies which showed significant correlations of HRQOL with disability [6,13]. A weak positive correlation was observed between pain intensity and disability. This supported yet another study which showed association between pain intensity and LBP disability [14]. In the index study, severe disability was a significant predictor of poor HRQOL. This finding is in agreement with the view in other studies which showed that the HRQOL of LBP patients is predicted by disability [6,15,16]. Another predictor of HRQOL in this study was overweight and obesity. This is consistent with other studies that have linked overweight and obesity as risk factors for LBP and poor HRQOL [17-19]. The significant predictors of severe disability in this study were those with poor mental health status (psychological distress), poor HRQOL and those with longer pain duration. There was an association between sedentary lifestyle and poor HRQOL in this study. This supports other studies that suggest that living a sedentary lifestyle is a risk factor for LBP and poor HRQOL [20,21].

Limitations

Other predictors of LBP outcome such as "fear avoidance behaviour" and "self-efficacy beliefs" were not investigated in this study.

Conclusion

There is the need to use a bio-psychosocial framework in the management of LBP patients. Addressing these factors in primary care at an early stage could lead to better long term outcomes. Adopting the bio-psychosocial perspective for the understanding and treatment of LBP should be cost effective in reducing episodes of this ailment and the associated social and health costs. Further research is recommended to explore how LBP disability can best be addressed by health professionals, especially Family physicians.

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