



## Relationship between Fear-Avoidance Belief, Self Efficacy, Pain and Disability in Individuals with Chronic Mechanical Low Back Pain

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### Abstract

*Understanding the influence of psychosocial factors on disability among patients with chronic mechanical low back pain (CMLBP) may help in predicting disability. This study was a cross-sectional survey that investigated the relationship among fear-avoidance belief (FAB), self-efficacy, pain and disability in patients with CMLBP. 106 patients (mean age = 54.36±14.88 years) were recruited from selected hospitals in Ibadan, Oyo State, Nigeria, using a purposive sampling method. Respondents' disability, FAB, self-efficacy and pain were measured using the Oswestry Low Back Pain Disability Questionnaire, FAB Questionnaire, Pain Self-Efficacy Scale and Numeric Pain Rating Scale respectively. Data were analysed using descriptive and inferential statistics of percentages, Spearman's rank correlation and linear regression with alpha level set at 0.05. There was a significant positive correlation between FAB and disability ( $r = 0.588$ ;  $p < 0.05$ ) as well as between pain and disability ( $r = 0.514$ ;  $p < 0.05$ ) while a significant negative correlation was observed between self-efficacy and disability ( $r = -0.614$ ;  $p < 0.05$ ). The regression equation between disability and FAB ( $F = 40.630$ ,  $p < 0.05$ ) is " $D = 0.530 (FA) + 14.241$ ", between disability and self-efficacy ( $F = 46.744$ ,  $p < 0.05$ ) is " $D = 0.582 (SE) + 59.987$ " as well as between disability and pain ( $F = 32.544$ ,  $p < 0.05$ ) is " $D = 0.493 (P) + 13.765$ ". FAB, self-efficacy and pain contributed significantly to disability in this study. Thus, the assessment of psychosocial factors and pain among patients with CMLBP is advocated to identify patients that are prone to developing disability.*

**Keywords:** *Disability; Fear-Avoidance Belief; Self-Efficacy; Pain; Chronic Mechanical Low Back Pain.*

### Introduction

Low back pain (LBP) is one of the most frequent reasons for consulting a general practitioner or a physical therapist (Ayanniyi, Lasisi, Adegoke & Oni-Orisan, 2007) and one of the most common and costly musculoskeletal problems in modern society (Furlan, Imamura, Dryden & Irvin, 2008; Ogunbode, Adebuseye & Alonge, 2013). About 70 to 85% of the population may experience LBP at least once (Andersson, 1999) but only a small proportion (5%) of people with an acute episode of low back pain will develop chronic low back pain and related disability. Early detection of risk

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for a transition of acute low back pain to chronic state and its prevention is a major challenge (Koes, van Tulder & Thomas, 2006).

Low back pain can be described as acute, sub-acute, recurrent, or chronic (Delitto *et al.*, 2012). Almost 90% of all patients with LBP will get better quickly (Coste, Delecoeuillerie, Cohen de Lara, LeParc & Paolaggi, 1994; Pengel, Herbert, Maher & Refshauge, 2003), regardless of therapy while the remaining 10% are at risk of developing chronic pain and disability and account for more than 90% of the social costs for back incapacity (Furlan *et al.*, 2008; Ogunbode *et al.*, 2013). Many guidelines for the management of LBP advocate for the identification of adverse prognostic factors such as fear-avoidance behaviours, low job satisfaction (Pengel *et al.*, 2003) and pain-related fear (Swinkels-Meewisse, Swinkels, Verbeek, Vlaeyen & Oostendorp, 2003). Pain-related beliefs, such as self-efficacy and fear-avoidance have been found to be more important determinants of disability than pain intensity and pain duration (Denison, Åsenlöf & Lindberg, 2004).

Self-efficacy refers to the individual's belief in their ability to execute behaviours necessary to produce specific performance attainments (Carey & Forsyth, 2009). Perceived self-efficacy is concerned with people's beliefs in their ability to change events that affect their lives (Bandura, 2010). Higher pain self-efficacy beliefs are predictive of reduced avoidance behaviours over an extended period (Asghari & Nicholas, 2001). Self-efficacy beliefs for people experiencing pain incorporate not just the expectation that a person could perform a particular behaviour or task, but also their confidence in being able to perform it in the presence of pain (Nicholas, 2007). Self-efficacy has been found to mediate the relationship between pain-related fear and pain intensity and between pain-related fear and disability. Therefore, when self-efficacy is high, elevated pain-related fear might not lead to greater pain and disability. However, in instances where self-efficacy is low, elevated pain-related fear is likely to lead to greater pain and disability (Woby, Urmston & Watson, 2007).

Fear-avoidance belief has been defined as the fear of pain which leads to the maintenance or exacerbation of fear, possibly generating a phobic state (Vlaeyen & Linton, 2000). Fear-avoidance beliefs are present in patients with acute low back pain (Fritz, George & Delitto, 2001) and it is an important factor in explaining the transition from acute to chronic conditions (Swinkels-Meewisse *et al.*, 2003). Fear-avoidance beliefs have also been found to influence pain-related disability both in early acute and long-term chronic LBP (Grotle, Vøllestad, Veierød, & Brox, 2004). Therefore, screening for fear-avoidance beliefs may be useful for identifying patients at risk of prolonged disability and work absence (Fritz *et al.*, 2001). This is because reductions in fear-avoidance beliefs about work and physical activity, as well as increased perceptions of control over pain, were uniquely related to reductions in disability (Woby, Watson, Roach & Urmston, 2004) and also pain-related fear (fear of pain, physical activity, injury or re-injury) may be more disabling than pain itself (Crombez, Vlaeyen, Heuts & Lysens, 1999).

The incidence of chronic low back disability has increased dramatically, after World War II, at a rate disproportionate to all other health conditions. Psychosocial and work

environmental factors have been found to be more accurate predictors of disability in low back pain than physical factors (Frymoyer & Cats-Baril, 1992). A closer evaluation of the economic burden of LBP reveals that it is the most common reason for activity limitation in individuals under the age of 45 and the ratio of direct costs to indirect costs of care was 3:1 (Odole, Akinpelu, Adekanle & Obisanya, 2011).

Given the high prevalence of chronic low back pain and its associated costs, high priority has to be placed on interventions that prevent recurrences and the transition to chronic low back pain (Delitto *et al.*, 2012). It is therefore recommended that fear-avoidance beliefs should be considered in the management of low back pain and disability (Waddell, Newton, Henderson, Somerville & Main, 1993) and that both pain-related fear and self-efficacy should be assessed when treating patients with LBP with high pain-related fear (Woby, Urmston & Watson, 2007).

This study aimed to investigate the relationship of severity of disability with fear-avoidance belief, self-efficacy and pain in patients with low back pain and also to determine the contributory role of fear-avoidance belief and self-efficacy in the severity of disability in low back pain.

## **Methods**

### **Respondents**

A purposive sampling technique was used to select 106 patients diagnosed with chronic low back pain from the physiotherapy clinics of six government-owned hospitals which include Adeoyo Maternity Teaching Hospital, Ibadan, Ring Road; State Hospital; University College Hospital, Ibadan; General Hospital, Oyo; General Hospital, Iseyin and General Hospital, Eruwa. Mackenzie and historical techniques were used in determining those patients with mechanical low back pain and only those with pain for more than three months were recruited to participate in this study.

### **Procedure**

Ethical approval was sought and obtained from the University of Ibadan/University College Hospital Institutional Review Committee for this study with an approval number UI/EC/15/0127. Permission was also sought and obtained from the heads of physiotherapy departments of the selected hospitals. The respondents were screened for exclusive criteria. The procedure of the study was explained to eligible respondents and their informed consent was sought and obtained.

Demographic information (age, sex, occupation, marital status and duration of pain) was obtained using a researcher-developed questionnaire. All the respondents had completed the English or Yoruba versions of the Numeric Pain Rating Scale, Oswestry Disability, Fear-Avoidance Belief and Pain Self-Efficacy Questionnaires. The completed questionnaires were all collected for documentation and reference purposes.

### **Instruments**

The following instruments were used for the data collection in this study:

1. Numeric Pain Rating Scale (McCaffery & Pasero, 1999) for assessing the respondents' level of pain.

2. Oswestry Low Back Pain Disability Questionnaire (Fairbank & Pynsent, 2000) for evaluating disability scores among the respondents. It is also known as the Oswestry Disability Index (ODI) and is one of the most commonly used outcome measures for low back pain (Fairbank & Pynsent, 2000).
3. Fear-Avoidance Belief Questionnaire (FABQ) (Waddell et al., 1993) to determine respondents' fear-avoidance belief scores.
4. Pain Self-Efficacy Questionnaire (PSEQ) (Nicholas, 1989) for the assessment of self-efficacy.
5. A demographic data form which was used to obtain information on the duration of pain, age, gender, occupation, marital status and level of education of the respondents.

**Data analysis**

Descriptive statistics of mean, standard deviation, range and percentages were used to summarise age, pain duration, sex, occupational status, employment status and marital status. Spearman's rank correlation was used to analyse the relationship between fear-avoidance belief, self-efficacy, pain and disability among the respondents. Regression analysis was used to investigate the contribution of each fear-avoidance belief, pain and self-efficacy in the severity of disability. The level of significance was set at  $P < 0.05$ .

**Results**

There were 106 respondents in this study comprising 50 (47.2%) males and 56 (52.8%) females as shown in Table 1. They were within the age range of 19 to 89 (mean age  $54.36 \pm 14.88$  years) with the highest number of respondents (28.3%) in the 50 to 59 age category.

**Table 1: Demographic characteristics of the respondents**

Variable	Category	n	%
<b>Age (years)</b>	20 -29	7	6.6
	30 - 39	15	14.2
	40 - 49	13	12.3
	50 - 59	30	28.3
	60 - 69	21	19.8
	70 - 79	16	15.1
<b>Gender</b>	80 – 89	4	3.8
	Male	50	47.2
<b>Marital status</b>	Female	56	52.8
	Single	4	3.8
	Married	92	86.8
	Divorced	0	0
	Widower	10	9.4
<b>Educational Attainment</b>	None	20	18.9
	Primary	20	18.9
	Secondary	8	7.5
	Tertiary	48	45.3
	Post-graduate	10	9.4
<b>Employment level</b>	Unemployed	22	20.8
	Employed	84	79.2

Table 2 shows Spearman’s correlation between disability and fear-avoidance belief, disability and self-efficacy as well as between disability and pain intensity of respondents with all the relationships tested being significant.

**Table 2:** Relationship among disability, FAB, self-efficacy and pain intensity

Disability	r	p
Self-efficacy	-0.614	<0.05
Fear-avoidance Belief (Total)	0.588	<0.05
Fear-avoidance Belief (Physical activity scale)	0.409	<0.05
Fear-avoidance Belief (Work scale)	0.529	<0.05
Pain intensity	0.514	<0.05

Symbols: r = Spearman’s correlation coefficient; p = significance level.

The results of the regression analysis among all the respondents is presented in Table 3. Note that the dependent variable is Disability while Fear-avoidance belief, Self-efficacy and Pain are the independent (predictor) variables.

**Table 3:** Summary for the regression analysis predicting Disability

	F	p	β	C
Fear-Avoidance Belief	40.630	<0.05	0.530	14.241
Self-Efficacy	46.744	<0.05	0.582	59.987
Pain	32.544	<0.05	0.493	13.765

Symbols: F = regression co-efficient; p = significance level at 0.05; β = beta co-efficient; C = constant

## Discussion

The preponderance of female over male respondents in our study was supported by the research endeavour of Heliövaara, Mäkelä, Knekt, Impivaara and Aromaa (1991), that of Hart, Deyo and Cherkin (1995) as well as that of Adegoke and Ezeukwu (2010) who all reported that female individuals (with low back pain) outnumbered their male counterparts. This finding might be due to the fact that females are not as engaged as men and therefore are more likely to be available to serve as participants in research than male individuals. The majority of the respondents in the current study were in paid employment and were likely to have less fear-avoidance beliefs. This was demonstrated in a previous study where patients that were out of work experienced more fear-avoidance beliefs in comparison to those who were still working (Pfungsten, Kröner-Herwig, Leibing, Kronshage & Jan Hildebrandt, 2000).

The scores for fear-avoidance belief in the physical activity and work sub-scales were significantly and positively correlated with each other. This implies that these sub-scales measure a similar construct (fear-avoidance belief) lending support to the findings of Waddell *et al.* (1993). The significant positive correlation between the scores for disability and fear-avoidance belief in the current study is in agreement with the findings of Fritz *et al.* (2001) and those of Staerkle *et al.* (2004) who investigated the relationship between fear-avoidance belief and disability. However, this significant positive relationship that we found between disability and fear-avoidance beliefs is not

in harmony with the result noted by Kovacs *et al.* (2005). These authors obtained a non-significant positive relationship between disability and fear-avoidance beliefs. Woby *et al.* (2004) revealed that changes in fear-avoidance beliefs correlated with changes in disability following treatment and Pfingsten *et al.* (2000) revealed that fear-avoidance beliefs contributed significantly to disability in activities of daily living and work loss. The significant negative correlation between pain, fear-avoidance beliefs, disability and self-efficacy observed in our study means that an individual's self-efficacy is reduced with higher fear-avoidance beliefs, higher pain intensity and higher level of disability. This also suggests that an improvement in self-efficacy of a patient may be achieved with reduction in the levels of fear-avoidance beliefs, pain and disability. Adegoke and Ezeukwu (2010) observed that the self-efficacy domain of physical function was not significantly related to pain intensity.

The study by Denison *et al.* (2004) did multiple hierarchical regressions and analysed between disability, self-efficacy, fear-avoidance belief and pain. The analysis showed that self-efficacy explained a considerably larger proportion of the variance in disability scores than fear-avoidance beliefs while pain intensity explained a small proportion. These results suggest that self-efficacy beliefs are more important determinants of disability than fear-avoidance beliefs. This is in accord with our findings because the linear regression done between disability and fear-avoidance belief, disability and self-efficacy as well as between disability and pain showed that self-efficacy had the highest regression coefficient, followed by fear-avoidance beliefs with pain having the least regression coefficient.

## Conclusion

The findings of this study discovered that fear-avoidance belief, self-efficacy and pain significantly contributed to the severity of disability in patients with chronic mechanical low back pain. Based on these findings, fear-avoidance belief and self-efficacy should be addressed in the management of patients with chronic mechanical low back pain.

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