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SELECTED PSYCHOSOCIAL PREDICTORS OF TREATMENT ADHERENCE AMONG INDIVIDUALS WITH CHRONIC MECHANICAL LOW BACK PAIN

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ABSTRACT: *One of the most challenging problems facing health care professionals globally is patients' non-adherence to treatment programs. This study therefore investigated the role of anxiety, depression, self-efficacy and social support on treatment adherence.Ninety-two purposively selected individuals diagnosed with mechanical low back pain (mean age* $\overline{X}$ *=37.45 ± 5.48) participated in this cross-sectional survey. A 95-item battery of scales (questionnaire) was used in measuring participants' bio-data, level of anxiety, depression, self-efficacy, social support, pain self-efficacy and treatment adherence. Descriptive (means; SD; and %) and inferential (multiple regression and ANOVA) statistics were employed in analysis, with three hypotheses tested at p<0.05. Anxiety, depression, self-efficacy and social support jointly predicted cognition (R=.57;* R^2*=.33;F(4,87)=10.64; p<.01), behavioral (R = .29;* R^2 *=.08; F (4,87) = 1.97; p<.05) and therapy satisfaction (R = .29;* R^2 *=.08; F (4,87) = 1.94;p<.05) domains of treatment adherence. Self-efficacy independently predicted behavioral (β=.59) and therapy satisfaction (β=.25) domains of treatment adherence (β=.25). Self-efficacy, social support, anxiety and depression are jointly pertinent in forecasting the cognition, treatment satisfaction and behavioural domains of treatment adherence among low back pain patients. Attention to these psychological factors would be needful in the management of treatment adherence among patients with low back pain*

KEYWORDS: Treatment adherence, self-efficacy, social support, anxiety, depression, low back pain

INTRODUCTION

Patient adherence to prescribed treatment and medical regimen continue to pose major challenges to health professionals. Treatment adherence as defined by Alikari and Zyga (2014) is the extent to which a person's behavior (in terms of taking medications or achieving lifestyle changes) coincides with advice from physicians or other health care providers. Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or is described with such

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damage. Any pain that persists for six months or longer is typically referred to as chronic pain **(**Merskey & Bogduk, 1994). Low Back Pain (LBP) is pain, muscle tension or stiffness, localized in the back below the costal margin and above the gluteal folds with or without leg pain (Smiths, Elliot, Chambers, Hannaford & Penny 2001). In 2003, the World Health Organization (WHO) identified medication non-adherence as the leading cause of preventable morbidity, mortality, and health care costs. (WHO, 2003)

Low back pain being the most common musculoskeletal problem in the work place particularly office work (Omokhodion & Sanya, 2003), is a major cause of work-related disability (Cunningham, Doody & Blake, 2008), which is associated with major costs in terms of health resource usage, worker disability and absenteeism (Maniadaki & Gray, 2000). Low back pain has been established as one of the most common reasons for sick leave in the western world (Reiso, Nygard, Jorgensen, Holanger, Soldal & Bruusgaard 2003). Great efforts have been made to improve the efficacy of treatment in patients diagnosed with low back pain in industrialized nations (Barnes, Powell & Nahin, 2004). Guidelines for the treatment of LBP have been developed to improve patient care and to reduce costs. This approach has also influenced researchers and other professionals in developing countries. However, the effectiveness of a particular treatment may be dependent upon patient adherence (Joyce, Anuja, Anita & Peter 2007; Frih, Fendri, Jellad, Boudoukhane & Rejeb 2009).

Non-adherence to medical regimen is a worldwide problem. According to WHO, the average rate of non-adherence in patients with chronic disease is 50% in developed countries (Sabate, 2003). This may be related to poor therapeutic results which lead to relapse of chronic illness (Peterson, Takiya & Finley, 2003). Poor adherence is estimated to cause 125 thousand deaths per year and is linked to 10% of all hospital stays in the U.S.A (Peterson et.al, 2003). In LBP, as in other chronic conditions, poor adherence to treatment and to medical advice is common and may contribute to substantial worsening of the disease and increased health care burden and costs.A significant proportion of hospital admissions can be attributed to treatment non-adherence (Awad, 2004). Symptom relapse as a result of non-adherence can be more severe and dangerous than those occurring while patients remain adherent with their medications (Awad, 2004).This problem deranges memory and attention, and can arouse feelings of anxiety and depression in patients with chronic pains who are not adherent to treatment regimen (Jacobs, Castro, Fuchs & Ferreira, 2011).

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Psychosocial factors like depression, anxiety, social support and self-efficacy have also been implicated in treatment adherence by Rush, Polatin and Gatchel (2000). Research literature shows consistent associations between measures of anxiety and pain, suggesting the possibilities that pain contributes to feelings of anxiety. Anxiety can make people more sensitive to pain and its negative effects. Similarly, anxiety either associated or not with fear, predicts pain-related disability by contributing to hyper vigilance and avoidance behaviors, thereby maintaining the pain experience (Keefe, Caldwell & Williams 2004). For example, the perception of pain may contribute to expectations that an event or behavior may cause or amplify pain, which can then increase anxiety and fear. This in turn results in hyper vigilance to bodily sensations and avoidance behaviors, followed by disability, disuse and depression, and ultimately to maintenance and exacerbations of pain (Keefe et.al 2004).

DiMatteo (2004) conducted a meta-analysis of psycho-social support and patient adherence to medical treatment. The influence of anxiety was insignificant. However, the influence of depression and treatment adherence was found to be significant among the study sample, but when compared with non-depressed patients the odds are three times greater that depressed patients will be noncompliant with medical treatment recommendations.

Research has shown that social support plays an important role in managing psychological problems (Yasin & Dzulkifli, 2010). It could be defined as a complex transactional process in which an active interplay between a person and his or her support network is involved (Vaux, 1988). It includes providing empathy, caring, love and trust (emotional support) actual in time, money and energy (instrumental support), evaluative feedback (appraisal support) and information, advice and suggestions (informational support). Further studies revealed that greater levels of social support particularly support from spouses and other family members, are associated with better treatment adherence (Peyrot et.al, 2005, Griffith, Field & Lustman 2010). Social support also serves to buffer the adverse effects of stress on pain management (Griffith, et.al, 2010). Social support can originate from different sources like family, work place, religious bodies and community. However, results on the mechanisms through which social support influences health and well-being are inconclusive (Gurung, 2006).

Self-efficacy, or the belief that one can carry out a behavior necessary to achieve a certain desired outcome, has been identified as one of the strongest and final determinants of health-promoting behavior in chronically ill populations, independent of disease severity or level of physical

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impairment (Bandura, 1986). Self-efficacy makes a difference in how people feel, think and act. Therefore patients who are low in self-efficacy will be pessimistic about his/her quality of life and may not adhere to medication regimens. In patients with cardiovascular disease, self-efficacy predicted adherence to exercise and diet regimens (Schweitzer, Dry & Dweyer, 2007). Self-efficacy appears to be a modifiable variable that can affect health status, influence mood and motivation, and maintain participation in daily routines and roles (Buck, Poole, & Mendelson, 2010). The importance of positive pain self-efficacy for successful adaptation to chronic pain is well documented and chronic pain could be influenced positively or negatively by self-efficacy (Arnstein, 2000; Turk & Okifuji, 2002).

There are no studies in Nigeria identifying anxiety, depression, self-efficacy and social support as predictors of treatment adherence among low back pain patients. However, some researchers in Nigeria (e.g.,Omokhodion & Sanya, 2003; Odole, Akinpelu, Adekanla, & Obisanya, 2011) have observed among others that painful conditions result in reduction in self-efficacy and performance of physical activities. The present study examined the role of anxiety, depression, self-efficacy and social support in treatment adherence among low back pain patients, from the patients' perspective.

It is hypothesized that:

i. anxiety, depression, self-efficacy and social support will have significant, independent and joint influence on cognition domain of treatment adherence

ii. anxiety, depression, self-efficacy and social support will have significant independent and joint influences on behavioral domain of treatment adherence and

iii. anxiety, depression, self-efficacy and social support will have significant independent and joint influences on therapy satisfaction domain of treatment adherence

Instruments and Methods

Design: This study adopted a **c**ross-sectional survey design to examine the influence of depression, anxiety, social support and self-efficacy on treatment adherence of patients with mechanical LBP

Participants: Ninety-two purposively sampled individuals clinically diagnosed with mechanical LBP at Physiotherapy Clinic, University College Hospital (UCH), Ibadan, Nigeria participated.

Pilot Study: A pilot study was conducted at University of Ibadan Health Center among thirty patients with LBP to pre-test the research instruments and also to determine the feasibility of the main study. This was followed by submission of the research protocol for ethical approval, which was granted by the UI/UCH ethics committee (Approval Number UI/EC/12/0414).

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Instruments: A 95–item structured self–report questionnaire, divided into 6 sections was used: Section A was designed to obtain participants' socio-demographic information including gender, age, occupation, marital status, and educational qualification among others.

Section B consisted of 14-item treatment adherence scale developed by Baiardini, et. al (2006) with response in Likert format. It measures 3 areas of treatment adherence i.e. cognition with 6 items; behavioral with 5 items and therapy satisfaction with 3 items. Higher score indicates that individuals are not adhering to treatment regimen, vice versa. The scale authors had earlier established co-efficient alpha of 0.78 for the scale. Norm of (N=92, $\bar{x}$ =22.8 and SD=8.4), as well as alpha coefficient of .79 were established in this study.

Section C is a 14-item Hospital Anxiety and Depression Scale (HADS) developed by Snaith and Zigmond (1986) for use among clinical populations. It has anxiety and depression sub-scales with 7 items each. The authors reported coefficient alpha of 0.89 for anxiety and 0.75 for depression. High score indicates high in depression or anxiety, vice versa. For this study, reliability co-efficient alpha of .85 for anxiety and .72 for depression was obtained and N=92, $\bar{x}$ =12.7 and SD=6.4 was established as norm. Participants' mean score on depression was $\bar{x}$ =22.02 ±4.3 while score on anxiety was $\bar{x}$ =22.63 ±5.39.

Section D is a 10-item Pain Self-Efficacy scale developed by Nicholas (2007) with a 4-point Likert response format. It measures the strength and generality of patients' belief about his/her ability to accomplish a range of activities despite pain. High scores indicate strong self-efficacy. Reliability co-efficient of 0.71 was reported by the author. For this study, reliability co-efficient alpha of .89 was obtained and N= 92, $\bar{x}$ =26.6 and SD=4.4 was established as norm.

Section E is a 9-item social support scale developed by Vaux, Riedel & Stewart, (1987). Higher score indicates higher social support while lower score shows low social support. Cronbach alpha of 0.85 was reported by the authors. For this study, reliability co-efficient alpha of .84 was obtained and N=92, $\bar{x}$ =26.0 and SD=7.4 was established as norm

Procedure: Approval for the study was obtained from University of Ibadan/University College Hospital (UCH) Ibadan Ethics Committee. The researchers also sought the permission of the Head of Physiotherapy clinic, UCH, Ibadan. Participants were informed of the nature, purpose, and anticipated discomfort associated with the study. They were also informed that participation was voluntary and that they were free to withdraw from the study at any time, without negative consequences.

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Confidentiality and anonymity were maintained by instructing respondents not to identify themselves in any way. Willing and consenting participants were given either English or Yoruba version of the questionnaires as appropriate. The questionnaires were distributed on the clinic days (i.e. Mondays, Wednesdays and Fridays) for 8 weeks. The questionnaire required about 20-25 minutes completion time. Participants were allowed up to 72 hours to read through and return the completed questionnaire to the clinic. Of 110 questionnaires administered, only 92 were correctly completed and returned, representing 83.6% response rate. Returned questionnaires considered adequate for data analysis were coded, stored and entered for data analysis using the SPSS 20.0. *Data Analysis:* Descriptive (means; SD; and %) and inferential (multiple regression and ANOVA) statistics were employed in analysis, with three hypotheses tested at $p<0.05$.

RESULTS

The frequency distribution of the study participants shows that 33 (35.3%) were males, 59 (64.7%) were females. Participants age showed that 37 (40.4%) were between 23-40 years and were classified as young participants while 55 (59.6%) were between 41-88 years and were classified as old. 8 (8.7%, $\bar{x}$=38.50 and SD=6.65) of the participants were single. 71 (77.2%) were married. 5 (5.4%) were divorcees while 8 (8.7%) were widows/widowers. Frequency distribution by educational qualification showed that 28 (30.4%) had primary school certificate. 19 (20.7%) had secondary school or ordinary diploma certificate. 39 (42.4%) had higher national diploma or first degree. 6 (6.5%) had postgraduate degree. 44 (47.8%) had illness duration less than one year while 48 (52.2%) had illness duration from one year and above. Pain intensity as reported by the participants shows that 26 (31.5%) reported having mild pain while 66 (68.5%) reported having worst pain. 73 (79.3%) had no co-morbid illness with LBP while19 (20.7%) had co-morbid illness with LBPThe first research hypothesis sought to investigate whether anxiety, depression, self-efficacy and social support will have significant, independent and joint influence on cognition domain of treatment adherence**.** It was tested with multiple regressions.

Table 1: **Multiple Regressions analysis showing influence of psychological factors on cognition d**omain **of treatment adherence**

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Variable	R	R^2	F	p	β	t	p
Anxiety					.13	.85	>.05
Depression					-.23	-1.45	>.05
Self-efficacy					.59	6.62	<.01
Social support	57	.33	10.64	<.01	.09	-1.04	>.05

Table 1 shows that psychological factors jointly predicted cognition domain of treatment adherence (R = .57; R^2 =.33; F (4,87)=10.64; p<.01) accounting for 33% variance in cognition domain of treatment adherence. However, analysis of the independent predictions indicated that self-efficacy only predicted significant independent influence on cognition domain of treatment adherence (β = .59; t =6.62; p<.01) meaning that pain self-efficacy could influence an individual to perceive cognition domain of treatment adherence.

The second research hypothesis sought to investigate whether anxiety, depression, self-efficacy and social support will have significant independent and joint influences on behavioral domain of treatment adherence. It was tested with multiple regressions.

Table 2: Multiple Regressions analysis showing influence of psychological factors on behavioral domain of treatment adherence

Variable	R	R^2	F	p	β	t	p
Anxiety					.11	.63	>.05
Depression					-.24	-1.28	>.05
Self-efficacy					.29	2.58	<.05
Social support	.29	.083	1.97	<.05	.05	-.49	>.05

Table 2 showed that psychological factors jointly predicted behavioral domain of treatment adherence (R = .29; R^2 =.08; F (4,87) = 1.97; p<.05) accounting for 8% variance in behavioral domain of treatment adherence . However, analysis of the independent predictions indicated that self-efficacy only predicted significant independent influence on behavioral domain of treatment adherence (β = .29; t =2.58; p<.05) meaning that pain self-efficacy could influence an individual behavior on treatment adherence.

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The third research hypothesis sought to investigate whether anxiety, depression, self-efficacy and social support will have significant independent and joint influences on therapy satisfaction domain of treatment adherence. It was tested with multiple regressions.

Table 3: Multiple Regression analysis showing the predictions of psychological factors on therapy satisfaction domain **of treatment adherence.**

Variable	**R**	**R^2**	**F**	**p**	**β**	**t**	**Sig**
Anxiety					.01	.05	>.05
Depression					-.03	-.15	>.05
Self-efficacy					.25	2.27	<.05
Social support	29	.082	1.94	<.05	-.18	-1.68	>.05

Table 3 shows that psychological factors jointly predicted therapy satisfaction domain of treatment adherence ($R = .29$; $R^2 = .08$; $F(4,87) = 1.94$; $p<.05$) accounting for 8% variance in therapy satisfaction domain of treatment adherence. However, the analysis of the independent predictions indicated that self-efficacy predicted significant independent influence on therapy satisfaction domain of treatment adherence ($\beta = .25$; $t = 2.27$; $p<.05$) implying that only self-efficacy could predict individual satisfaction of treatment adherence.

DISCUSSION

This study was designed to investigate psychological factors of anxiety, depression, self-efficacy and social support as predictors of treatment adherence among patients with mechanical LBP. The analysis revealed a significant joint influence of anxiety, depression, self-efficacy and social support on cognition domain of treatment adherence, while self-efficacy only had independent influence on cognition domain of treatment adherence. There was significant joint prediction of anxiety, depression self-efficacy and social support on behavioral domain of treatment adherence while self-efficacy is the only independent predictor of behavior domain of TA. Also there was significant joint prediction of anxiety, depression, self-efficacy and social support on therapy satisfaction domain of treatment adherence. Only self-efficacy had significant independent prediction on therapy satisfaction domain of treatment adherence.

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Overall, result of this study established psychosocial factors of anxiety, depression, self-efficacy and social support as predictors of all the three domains of treatment adherence, suggesting the need not only for a greater attention to its improvement, but consideration of the psychological factors that determine its appreciation.

This study revealed that all the independent variables jointly predicted cognition domain of treatment adherence. Also, the independent prediction showed that self-efficacy was significant on cognition domain of treatment adherence among patients with LBP. This means that self-efficacy is the only psychosocial factor that independently predicted cognition domain of treatment adherence among all the psychosocial variables of interest. The result demonstrated that in the presence of the variables influence on the cognition domain of treatment adherence where self-efficacy was the most important predictor of how patient think about adhering to treatment. Patient who feels confidence of managing their treatment regimen perceived themselves as been capable of adhering to treatment. However the role of anxiety, depression, and social support were found to be negligible or play a less role in patient perception.

This is also in agreement with the findings of Schweitzer et.al (2007); who found that psychological factors of anxiety and depression do not predict treatment adherence but behavior specific self-efficacy was found to be a moderate to strong predictor of treatment adherence

Further findings showed that the presence of anxiety, depression, self-efficacy and social support have significant joint influence on behavioral domain of treatment adherence where self-efficacy play a major independent prediction of how patient behave on adhering to treatment regimen. Patient who feels that they are in control of their health perceived themselves as been capable of adhering to the treatment regimen. However anxiety, depression, and social support play fewer roles in the patient's behavior on treatment adherence.

Even though there has not been much literature review that support this particular hypothesis in the present study, it was reported in a study by Baiardini et.al, (2006), that self-management of asthma in daily life presents some critical aspects: patients report being unable to take medicines correctly (25.4 %) and an inability to identify worsening signs (19 %) and monitor clinical parameters (57.1 %), which were components of adherence behavior.

Result also showed that anxiety, depression, self-efficacy and social support jointly predicted therapy satisfaction domain of treatment adherence among the study sample. However self-efficacy is the only independent predictor of therapy satisfaction domain of treatment adherence.

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Patients who are about their treatment regimen were satisfied of the treatment received and perceived themselves as been capable of adhering to treatment regimen. However anxiety, depression, and social support play negligible role in patient's satisfaction of their treatment adherence.

This finding is at variance with an earlier study by Biardini et.al (2006). In their study they reported that concerning the prescribed medicines, 41.8% of their sample were not certain that asthma therapy was necessary and 28.2% reported fear of side effects. The treatment benefits were not considered greater than the disadvantages in 15.9 % of patients. Depression and anxiety, as measured by Hospital Anxiety and Depression Scale (HADS) were present in a small percentage of patients (9.5% and 11.1 %, respectively). In another study by Schweitzer et.al (2007) in testing the hypothesis that depression, anxiety, and self-efficacy are independent predictors of adherence behavior, these authors reported that depression (33.3% scored > 10 on BDI) was not a predictor of adherence. Trait anxiety (31% scored > 40 on STAI) explained minimal variability regarding smoking and alcohol adherence. Self-efficacy strongly predicted adherence to most recommendations.

Limitations: This study is not without limitations. The sample size for the study was not large enough compared to the population of mechanical LBP patients in Nigeria. Majority of the participants were so conscious and some expressly asked questions about the outcome of the study convincingly just to show that social desirability responses may be inclusive in the data collected for the analysis.

Adaptation behavior and different scales of reference can bias self-assessments of all the scales of measurement used in this study by individuals. Reliance upon self-report regarding psychological morbidity and adherence behavior and the measurement of self-maintenance behaviors by a study specific questionnaire, suggests that findings should be considered with caution.

Additionally, the adoption of both qualitative and quantitative data collection techniques generated a massive data set beyond the contents of the results presented in this paper. However, these provided a good opportunity for not only understanding the content and context of the participants' responses but also allowed for a comparison of both data gathering methods, which in this study is highly similar, suggesting that the results are reliable.

Conclusion: The results of this study, keeping other things constant, have proved that treatment adherence among patients with mechanical LBP is influenced by self-efficacy, social support, depression and anxiety. The role of self-efficacy, in the evaluation of treatment adherence was also established. It is therefore, recommended that patients with LBP pay attention to the psychological variables examined in this study which can influence their adhering to treatment regimen. Further

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research with larger samples addressing age and gender, should be conducted to determine other psychological factors that could serve as predictors of treatment adherence among patients with LBP. However, it is likely that there are other psychological variables that could contribute meaningfully to treatment adherence among LBP patients in this culture. Another study can look into cultural beliefs, pain intensity and fear avoidance on treatment adherence in this population.

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