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Research Article

Selected Psychosocial Predictors of Treatment Adherence among Individuals with Chronic Mechanical Low Back Pain in University College Hospital, Ibadan, Nigeria

Oyeleke J.T, Adejumo A.O, Odole A.C

¹*Department of Psychology, University of Ilorin, Ilorin, Nigeria*

²*Department of Psychology, University of Ibadan, Ibadan, Nigeria*

³*Department of Physiotherapy, University College Hospital, University of Ibadan, Ibadan, Nigeria*

ABSTRACT

Non-adherence to treatment regimens is one of the most challenging problems facing health professionals today. The current study 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 ($M_{age}=37.45\text{years}$; $SD = 5.48$) 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. 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 ($R=.57$; $R^2=.33$; $F_{(4, 87)} = 10.64$), behavioral ($R = .29$; $R^2 = .08$; $F_{(4, 87)} = 1.97$) and therapy satisfaction ($R = .29$; $R^2 = .08$; $F_{(4, 87)} = 1.94$) domains of treatment adherence. Self-efficacy independently predicted behavioral ($\beta=.59$) and therapy satisfaction ($\beta=.25$) domains of treatment adherence ($\beta=.25$). Self-efficacy, social support, anxiety and depression are jointly predictors of three 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*

*Author for correspondence: *E-mail: -oyelekejohanson@gmail.com; Tel. +234 703 365 6765*

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INTRODUCTION

Patient adherence to prescribed treatment and medical regimen continue to pose major challenges to health professionals. Alikari and Zyga (2014) defined treatment adherence as 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 damage. Chronic pain was defined as persistent or recurrent pain lasting longer than 3 months (Treede et.al, 2015). 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 (Balagué, et.al. 2012).

Non-adherence to medical regimen is a worldwide problem. Chronic illnesses are the first significant cause of mortality in the world, accounting for 60% of all deaths worldwide and 70% of all deaths in Iran. (Rafii, et.al 2014). Non-compliance can lead to unmet treatment expectations. In developed countries, approximately 50% of the patients with chronic illnesses follow treatment. In developing countries, poor compliance threatens to render any efforts to manage chronic conditions ineffective (Rafii, et.al, 2014). This may be related to poor therapeutic results which lead to relapse of chronic illnesses. In low back pain, 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.

Psychosocial factors like depression, anxiety, social support and self-efficacy have been implicated in treatment adherence (Schweitzer et.al, 2007). Research literature shows

consistent associations between measures of anxiety and pain, suggesting the possibilities that pain contributes to feelings of anxiety. This leads to avoidance behaviors, and hyper vigilance to bodily sensations followed by disability, disuse and depression. The latter will maintain the pain experiences thereby fueling the vicious circle of increasing fear and avoidance (Koho, 2015). 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.

Studies have shown that social support plays an important role in managing psychological problems. 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 (Gallagher et.al, 2015). 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 (Marquez, et.al, 2017). Social support also serves to buffer the adverse effects of stress on pain management. 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.

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 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 et.al, 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 (Yazdi-Ravanda et.al, 2013). The importance of positive pain self-efficacy for successful adaptation to chronic pain cannot be overemphasized because chronic pain could be influenced positively or negatively by self-efficacy (Yazdi-Ravanda et.al, 2013).

There are no studies in Nigeria that has identified anxiety, depression, self-efficacy and social support as predictors of treatment adherence among low back pain patients. However, some researchers in Nigeria (Odole, et.al, 2012) have observed among others that painful conditions result in reduction in self-efficacy and performance of physical activities. The present study therefore examined the role of anxiety, depression, self-efficacy and social support in treatment adherence among patients with low back pain, from the patients' perspective.

MATERIALS AND METHODS

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. Confidentiality and anonymity were maintained by instructing respondents not to identify themselves in any way.

Study Design: This study adopted a cross-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 in the study between February 2nd and May 4th, 2015.

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, mean=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 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, mean =12.7 and SD=6.4 was established as norm.

Participants' mean score on depression was $\bar{x} = 22.02 \pm 4.3$ while score on anxiety was mean =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, mean =26.6 and SD=4.4 was established as norm. Section E is a 9-item social support scale developed by Vaux et.al, (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, mean =26.0 and SD =7.4 was established as norm

Procedure: Willing and consenting participants were given either English or Yoruba version of the questionnaires as appropriate. The questionnaires were distributed on the clinic days (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.

Data Analysis:

Returned questionnaires considered adequate for data analysis were coded, stored and entered for data analysis using the SPSS 20.0. Descriptive (means; SD; and %) and inferential (multiple regressions) statistics were employed in analysis, with three hypotheses tested at p<0.05.

RESULTS

Socio-demographic characteristics of the participants

Ninety-two patients (male = 33 (35.3%); female = 59 (64.7%) presenting with low back pain with mean age 37.45±5.48 years participated in this study. Thirty-seven (40.4%) were between 23-40 years and were classified as young participants while 55 (59.6%) who were between 41-88 years were classified as old. Majority (77.2%) were married. Almost half (48.9%) of the participants had Tertiary Education. The socio-demographic characteristics of the participants are shown in Table 1.

Table 1:

Demographic and Psychological Characteristics of Participants of the Study

Variable	n	%
Gender		
Male	33	35.3
Female	59	64.7
Age		
Young	37	40.4
Old	55	59.6
Mean age ± SD	37.8 ± 5.48	
Marital Status		
Single	8	8.7
Married	71	77.2
Divorced	5	5.4
Widowed	8	8.7
Educational qualification		
Primary	28	30.4
Secondary	19	20.7
Tertiary	45	48.9

Table 2:

Psychosocial Characteristics of the Participants

Variable	n	%
Duration of illness		
<1 year	44	47.8
1 year and above	48	52.2
Pain intensity		
Mild pain	26	31.5
Worst pain	66	68.5
Anxiety		
Low	65	70.7
High	27	28.3
Depression		
Low	64	69.6
High	28	30.4
Self-Efficacy		
Low	77	83.7
High	15	15.3
Social Support		
Low	68	73.9
High	24	20.1

Psychosocial characteristics of the participants

Over a third (68.5%) of the participants reported having worst pain. Likewise (70.7%) reported been low in anxiety while (69.6%) of the participants reported been low in depression. Seventy-seven representing (83.7%) of the participants reported having low self-efficacy. Sixty-eight (73.9%) reported to be low in social support. The psychosocial characteristics of the participants are shown in Table 2.

Table 3

Multiple Regressions analysis showing influence of psychological factors on cognition domain of treatment adherence

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

Results from table 3 show that psychological factors jointly predicted cognition domain of treatment adherence (R = .57; R² =.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.

Results from table 4 show 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 ($\beta = .29$; $t = 2.58$; $p < .05$) meaning that pain self-efficacy could influence an individual behavior on treatment adherence.

Table 4

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

Variable	R	R ²	F	p	β	t	p
Self-efficacy					.11	.63	>.05
Depression					-.24	-1.28	>.05
Anxiety					.29	2.58	<.05
Social support	.29	.083	1.97	<.05	.05	-0.49	>.05

Table 5

Multiple Regression analysis showing the predictions of psychological factors on therapy satisfaction domain of treatment adherence

Variable	R	R ²	F	p	β	t	p
Self-efficacy					.01	.05	>.05
Depression					-.03	-.15	>.05
Anxiety					.25	2.27	<.05
Social support	.29	.082	1.94	<.05	.05	-0.18	>.05

Results from Table 5 show 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 psychosocial factors of anxiety, depression, self-efficacy and social support as predictors of treatment adherence among patients with mechanical low back pain. 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 treatment adherence. 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.

Overall, the results of this study established that psychosocial factors of anxiety, depression, self-efficacy and social support are 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. These findings support that of a previous study by Maeda et.al (2013). The authors reported that self-efficacy mediated the associations of social support and depression with treatment adherence after adjusting for demographic characteristics (age, gender, marital status, education, and ethnicity) and medical covariates. Their findings showed that self-efficacy explains the influence of social support and depression on treatment adherence and may be a key target for interventions to improve disease management and self-care behaviors in heart failure patients.

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 low back pain. 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.

Some authors have reported that several factors may have an important relationship with treatment adherence in many diseases (Jack *et al.*, 2010; Schweitzer *et al.* 2007). Jack *et al.* (2010) in a systematic review on barriers to treatment adherence in physiotherapy outpatient clinics reported strong evidence that poor treatment adherence was associated with low levels of physical activity at baseline or in previous weeks, low in-treatment adherence with exercise, low self-efficacy, depression, anxiety, helplessness, poor social support/activity, greater perceived number of barriers to exercise and increased pain levels during exercise. Strategies to overcome these barriers and improve adherence are considered. They found limited evidence for many factors and further high quality research is required to investigate the predictive validity of these potential barriers. 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 from the present study 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. Patients who feel 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 lesser roles in the patient's behavior on treatment adherence.

This findings was at variance with that of an earlier study by Gu, et.al (2017) titled Association of Social Support and Medication Adherence in Chinese patients with Type 2 Diabetes Mellitus (T2DM). Their study was aimed to examine whether social support is associated with medication adherence in patients with T2DM. Regression analysis showed that social support presented a positive effect on medication adherence, additionally, support utilization and the subscale of social support exhibited a significantly strong influence on medication adherence in patients with T2DM. Although medication adherence was influenced by multiple factors, this finding confirmed that social support must be recognized as a core element in interventions aimed at improving in the management of patients with T2DM.

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. Patients who feel confidence 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 findings was in line with earlier study by Tovar, et.al (2015) in their study on self-efficacy mediates the relationship of depressive symptoms and social support with adherence in patients with heart failure using secondary data analysis of cross-sectional data from 346 adults with heart failure measuring self-efficacy, depressive symptoms, social support, and self-care adherence was conducted. Tests of mediation using multiple linear regressions indicate that self-efficacy fully mediates the relationships between depression and adherence, and social support and adherence. They recommended that bolstering self-efficacy may have a greater impact on self-care adherence than targeting either depression or social support alone

The result also supported the findings of Marino, (2008) on impact of social support and self-efficacy on functioning in depressed older adults with chronic obstructive pulmonary disease where one hundred and fifty-six subjects completed assessments of depression, functioning, social support, and self-efficacy at admission to the rehabilitation unit. Regression analyses were conducted to evaluate the impact of different aspects of social support and self-efficacy on overall functioning at admission controlling for depression, COPD severity, and age, subjective social support ($p = 0.05$) and self-efficacy ($p < 0.01$) were associated with overall functioning. They concluded that the perception of social support as well as self-efficacy are important constructs related to overall functioning among depressed older adults with COPD. Attention to these psychosocial variables in health

management interventions may help maintain or improve the overall functioning of depressed COPD patients.

However this finding is at variance with that of 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 for generalizability of 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 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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REFERENCES

Alikari, V., Zyga, S. (2014): Conceptual analysis of patient compliance in treatment and its impact on health care quality improvement. *Health Science Journal*,; 8(2), 179-186.

Baiardini, I., Braido, F., Giardini, A., Majani, G., Cacciola, C., Rogaku, A., Scordamagha, A., and Canonica, G. W (2006): Adherence to treatment: Assessment of an unmet need in Asthma. *Journal of Investigative Clinical Immunological.*; 16(4), 218-223.

Balagué, F., Mannion, A.F., Pellisé, F., Cedraschi, C (2012): Non-Specific Low Back Pain. *Lancet*,; 19, 379.

Bandura A. *Social foundations of thought and action: a social cognitive theory.* Englewood Cliffs, 1986; NJ: Prentice-Hall.

Gallagher, M., Muldoon, O.T., Pettigrew J. (2015): An integrative review of social and occupational factors influencing health and wellbeing. *Front Psychology.*; 6: 1281.

Gu, L., Wu, S., Zhao, S., Zhou, H., Zhang, S Gao, M., Qu, Z., Zhang, W Tian, D (2017): Association of Social Support and Medication Adherence in Chinese Patients with Type 2 Diabetes Mellitus. *International Journal of Environmental Research and Public Health.* 14(12): 1522.

Jack K. Mclean, S, M., Moffett, J, K Gardinerc E. (2010): Barriers to treatment adherence in physiotherapy outpatient clinics: A systematic review *Manual Therapy* 15(3-2): 220–228.

Koho, P. (2015): Fear of Movement: Epidemiological and clinical evaluation in the Finnish general population and chronic musculoskeletal pain patients and relevance for rehabilitation. Academic Dissertation presented with the permission of the Faculty of Medicine of The University of Helsinki, for public examination in the Auditorium of the Invalid Foundation, Tenholantie 10.

Maeda, U., Shen, B. S., Schwarz, E.R., Farrell, K. A., Mallon, S (2013): Self-Efficacy Mediates the Associations of Social Support and Depression with Treatment Adherence in Heart Failure Patients. *International Journal of Behavioral Medicine* March, Volume 20, Issue 1, pp 88–96

Marino, P., Sirey, J. A., Raue, P.J., George S., Alexopoulos, G. S (2008). Impact of social support and self-efficacy on functioning in depressed older adults with chronic obstructive pulmonary disease. *International Journal of Chronic Obstructive Pulmonary Disease.* 3(4): 713–718.

Marquez, B., Anderson, A., Wing, R. R., West, D. S., Newton, R. L., Meancham, M., Hazuda, H., Peters, A., Montez, M. G., Broyles, S.T., Walker, M and Hudsnall, G. E. (2017). The relationship of social support with treatment adherence and weight loss in Latinos with type 2 diabetes. *Obesity (Silver Spring).* 2017; Mar; 24(3): 568–575.

Nicholas, M. K. (2007): The pain self-efficacy questionnaire: Taking pain into account. *European Journal of pain.* 11(2), 153–163.

Odole, A.C., Akinpelu, A. A., Adekanla, B. A. and Obisanya, O.B. (2012): Economic Burden of Low Back Pain on Patients Seen at the Outpatient Physiotherapy Clinics of Secondary and Tertiary Health Institutions in Ibadan. *Journal of Nigeria Society of Physiotherapy,* 18 & 19: 44-48.

Raffi, F., Fatemi, N. S., Danielson, E., Johansson, C. M., Modanloo, M. (2014): Compliance to treatment in patients with chronic illness: A concept exploration. *Iran Journal of Nursing and Midwifery Res.* 19(2): 159–167

Schweitzer, R., Dry, H. K., Dwyer, J.W (2007). Psychological Factors and Treatment Adherence Behavior, in Patients with Chronic Heart Failure. *Journal of Cardiovascular Nursing.* 22, (1) 76-83

Snaith, R.P., Zigmond, A. S. (1986): The hospital anxiety and depression scale. *British Medical Journal of Clinical Research;* 1986; 292:344

Treede, R., Rief, W., Barke, A., Aziz, Q., Bennett, M. I., Benoliel, R., Cohen, M., Evers, S., Finnerup, N. B., First, M. B., Giamberardino, M. A., Kaasa, S., Kosek, E., Lavand'homme, P., Nicholas, M., Perrot, S., Scholz, J., Shug, S., Smith, B. H., Svensson, P., Vlaeyen, W. S., Wang S. J. (2015): A classification of chronic pain for ICD-11. *Pain.* 2015 Jun; 156(6): 1003–1007.

Torresan, M. M., Garrino, L., Borraccino, A. Macchi G., Luca, A., Dimonte, V. (2015): Adherence to treatment in patient with severe cancer pain: A qualitative enquiry through illness narratives. *European Journal of Oncology Nursing.* Volume 19, Issue 4, Pages 397-404

Tovar, E. G., Dekker, R. L., Chung, M. L Gokun, Y., Moser, K. M., Lennie, T. A., Rayens M. K (2015). Self-efficacy mediates the relationship of depressive symptoms and social support with adherence in patients with heart failure. *Journal of Health Psychology,* 1–11

Yazdi-Ravanda, S., Taslimi, Z., Jamshidian, N., Saberi, H., Shams, J., Haghparast A (2013):. Prediction of Quality of life by Self-Efficacy, Pain Intensity and Pain Duration in Patient with Pain Disorders. *Basic Clinical Neuroscience.* 2013 spring; 4(2): 117–124.