

**COMPARATIVE EFFECTIVENESS OF TWO  
STABILIZATION EXERCISE POSITIONS ON PAIN AND FUNCTIONAL DISABILITY OF  
PATIENTS WITH  
NON-SPECIFIC CHRONIC LOW BACK PAIN**

**BY**

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**A THESIS SUBMITTED TO THE DEPARTMENT OF MEDICAL REHABILITATION,  
AND POST-GRADUATE COLLEGE OF OBAFEMI AWOLOWO UNIVERSITY, ILE-  
IFE, NIGERIA, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
AWARD OF MASTER OF SCIENCE (M. Sc) DEGREE IN PHYSIOTHERAPY**

**MARCH, 2016**

**CERTIFICATION**

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## DEDICATION

This work is dedicated to Almighty Allah, my Husband and Children.

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## ACKNOWLEDGEMENT

I thank Almighty Allah, my creator and sustainer who provided for me, protected and saw me through this Master of Science degree programme (M.Sc.) at the Obafemi Awolowo University, Ile-Ife. All glory, honour and adoration belong to Him.

My profound gratitude goes to my able and amiable supervisor, Dr A.O. Ojoawo, Senior Lecturer at the Department of Medical Rehabilitation, Obafemi Awolowo University, Ile-Ife. Thanks so much for your immense contributions towards the success of this degree programme. Despite his tight schedule he still found time to supervise my project. May God Almighty continue to bless and uplift you in all your endeavours (Amen).

I also want to show my sincere appreciation to Prof. M.O.B. Olaogun for the knowledge imparted on me during the course of my study at Ile-Ife. You are indeed a teacher of teachers. May God Almighty Continue to strengthen you (Amen) . I appreciate the efforts of Dr. M.O. Egwu (Reader, the postgraduate co-ordinator of the Department of Medical Rehabilitation, Obafemi Awolowo University, Ile –Ife. Dr. A.T. Onigbinde, Dr (Mrs) A.O. Obembe, Dr (Mrs) O.E. Johnson, Rtd. Col. A.A.I. Emechete, Dr. C. E . Mbada, Dr T.O Awotidebe and Mr A.O Olaoye for their contributions toward the success of this programme. God bless you all (Amen).

I am indebted to Prof. R.A. Adedoyin ( Acting Head of Department, Medical Rehabilitation, O.A.U. Ile-Ife and Consultant Cardiopulmonary Physiotherapist at the O.A.U.T.H.C., Ile- Ife), a complete gentleman who always wants his students to excel in all their

endeavours. If not for his timely intervention, this programme would have been terminated. Thank you very much sir. May God bless you (Amen) .

My gratitude also goes to other members of staff of the department in person of Mrs T. Bibilari, Mr. T. Adeleke, and Miss T. Olatunbosun. May God Almighty Continue to be with you all (Amen).

I wish to express my sincere gratitude to my boss at work Mr E.A. Adelowokan (Director of Physiotherapy and Medical Rehabilitation Services, Osun State Hospitals Management Board) and Mr S Oluwafemi (Head of Department, State Specialist Hospital, Asubiaro, Osogbo) for their encouragements and supports throughout the programme. May God bless you (Amen) . I also want to appreciate my colleagues at work Mrs A.C Akinyoade, and all the interns at the Department of Physiotherapy, State Specialist Hospital, Asubiaro, Osogbo, for their sacrifices and understanding during the course of my study. May God continue to strengthen you all (Amen).

I need to thank my friends and sisters in Islam for their moral and spiritual support when the journey seems to be tough. May Allah continue to bless you all.

I also appreciate all my clients for their co-operation during the course of the study, without them this study would not have been feasible. I pray to God Almighty to continue to give you sound health. I also appreciate Sister R. AbdulRaheem who spared her time to put me through the computer work. May Allah answer all your Prayers (Amen).

I acknowledge my classmates that we undertook this M. Sc programme together for their encouragements. “United we stand, divided we fall”. God bless you all.

My heartfelt gratitude goes to my darling husband, Dr Mustapha Busuyi Hassan for his encouragements, moral and financial support throughout the course of this programme and my lovely children for their co-operation and understanding. I pray we will all live to enjoy the fruits of our labour together and Almighty Allah will make us to excel in our entire endeavour (Amen).

Hassan Mulikat Abiola.

March, 2016.

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## ABSTRACT

This study investigated the effects of two stabilization exercise positions (prone and supine) on pain and functional disability (FD) of patients with Non-specific Chronic Low Back Pain (NSCLBP). This was with the view to comparing the effects of the two stabilization exercise positions separately and combined on pain and FD of patients with NSCLBP.

This study was a randomized-controlled trial involving thirty three subjects with NSCLBP. The subjects were randomly assigned into stabilization in prone (SIP), stabilization in supine (SIS) and combined position (SIPS) groups using fish bowl technique. Subjects in all the groups received infra-red radiation for 15 minutes and kneading massage at the low back region. Subjects in SIP, SIS, and SIPS groups received stabilization exercise in prone lying, supine lying and combination of both positions respectively. Treatment was applied twice weekly for eight weeks. The verbal rating scale and the Roland Morris Low Back Pain Disability Questionnaires were used to assess the pain intensity (PI) and FD level of each subject at baseline, 4<sup>th</sup> and 8<sup>th</sup> week respectively of the treatment sessions. Data were analyzed using descriptive and inferential statistics, Kruskal-Wallis and turkey multiple comparisons post-hoc tests. The alpha level was set at  $p < 0.05$ .

Subjects' mean age was  $51.72 \pm 11.51$  years. Within-group comparison indicated PI and FD at the 4<sup>th</sup> (17.27; 16.05) and 8<sup>th</sup> week (8.27; 9.18) were significantly reduced ( $H=19.752$ ,  $p < 0.001$ ;  $H=16.501$ ,  $p < 0.001$ ) when compared with baseline (25.45; 25.77) in the SIP group. Similarly, the PI and FD at the 4<sup>th</sup> (15.23; 13.91) and 8<sup>th</sup> week (10.50; 10.59) were significantly reduced ( $H= 14.717$ ,  $p < 0.001$ ;  $H=17.351$ ,  $p < 0.001$ ) when compared with baseline (25.27;

26.50) within the SIS group. In the SIPS group, PI and FD were also significantly reduced ( $H=17.899$ ,  $p < 0.001$ ;  $H=3.230$ ,  $p = 0.199$ ) at the 4th (14.82; 12.91) and 8th week (17.00; 18.14) when compared with baseline (19.18; 19.95). However, the result of the Kruskal-Wallis test showed that there was no significant difference in the PI and FD at the baseline ( $H= 2.388$ ,  $p = 0.703$ ;  $H= 4.508$ ,  $p= 0.232$ ), 4<sup>th</sup> ( $H= 1.379$ ,  $p= 0.502$ ;  $H= 3.230$ ,  $p= 0.199$ ) and 8<sup>th</sup> week ( $H= 0.000$ ,  $p= 1.000$ ;  $H= 0.721$ ,  $p= 0.697$ ) of the treatment sessions across the three groups when compared.

It was concluded from the study, that stabilization exercises carried out in prone, supine and combination of the two positions were equally effective in managing pain and disability of patients with non- specific chronic low back pain. However, no position was superior to the other.

## CHAPTER ONE

### 1.1 BACKGROUND OF THE STUDY

Low back pain (LBP) had been a major public health problem all over the world in which most people had suffered series of incapacity at one time or the other in their life time (Koley et al, 2009). It is a prevalent musculoskeletal condition, and a common cause of disability especially in its chronic/recurrent state (Johnson, 2012). Prevalence of LBP among Africans is rising and should be of global concern (Omokhodion, 2002). LBP has a point prevalence of about 7 to 33% and lifetime prevalence of nearly 85% (Walker, 2000). Frank et al, (1996); Vollin, (1997) reported similarly that it affects about 70-85% of individuals once in their lifetime.

Non Specific Chronic low back pain (NSCLBP) is a widespread problem with major social and economical consequences (Martin et al, 2008, Manchikanti et al, 2009). It limits activity in individual younger than 45years of age in industrialized and developed countries and is considered to be one of the most common reasons for individuals to consult a physician (Andersson, 1999). The report of Louw et al, (2007) on LBP in Africa revealed a prevalence of 12% among adolescence and 32% among adult. In another study conducted by Omokhodion (2002) it was concluded that prevalence of LBP among Africans is rising and should be of concern.

LBP occurs in a wide variety of medical, musculoskeletal, and neurologic conditions (Roach et al, 1997, Cypress, 1983). Most individuals reporting at the clinic for management of excruciating LBP have experienced pain in the low back many times before the episode that brings them to the hospital. It accounts for serious job absenteeism in industrialized societies, a



case that would have been similar in most parts of Africa except that there is hardly any financial compensation for sick leave, hence less report of LBP in clinics (Krismer and Van tudler, 2007, Nachemson 2000, Andersson 1999). Omokhodion (2002) , conducted a survey in the south-western part of Nigeria and found out that 40% of the sample population had LBP in the past 12months, whereas 33% had LBP at the time of study, indicating that LBP is a common condition among Africans that is rising and should be of global concern (Omokhodion, 2002).

LBP is regarded as a symptom from impairments in the structures in the low back which originates from muscles, ligaments and intervertebral disc (Siegfried et al, 2010). It is a symptom of myriad of causes which can be primary i.e. mechanical/non specific and also secondary with an underlying pathology i.e. non-mechanical. The mechanical causes account for about 90% of cases while the non-mechanical causes occur in the rest of the population (Cohen et al; 2008, Manusov, 2012). NSCLBP appears to be commoner, affecting mostly individuals between ages 30 and 50years (Anderson 1999). However in children and adolescents it appears to be usually secondary to an underlying pathology (Johnson, 2012). The duration of back pain is considered in three categories, following the expected pattern of healing of connective tissue. Acute pain lasts up to 6 weeks, sub acute pain refers to the second half of the acute period, (6 to 12 weeks), and chronic pain persists beyond 12 weeks. (King, 2013).

Implicated muscles in LBP are the lumbar multifidi and abdominals especially the transversus abdominis (Johnson, 2012). Evidences by Hides et al (1992, 2008) supported the positive role of the lumbar multifidus muscle in segmental stabilization of the lumbar spine. Panjabi (1992) reported evidences of lumbar instability, low muscular strength and endurance among subjects with LBP as a result of tissue damage. The multifidi extend along the entire length of the spine and is much thicker at the low back and waist (Johnson, 2002), comprising

superficial and deep fibers. The transversus abdominis is the chief abdominal stabilizer of the spine. The quadratus lumborum, pelvic floor muscles, internal and external oblique, rectus abdominis, iliopsoas and paraspinal muscles are other muscles that contribute to stability of the spine (Mc Gill, 2002).

The majority of LBP episodes resolve spontaneously while a significant minority becomes recurrent and a small percentage remain persistent (Dunn and Croft, 2004). Management of LBP is costly, accounting for a large and increasing proportion of health care expenditures without evidence of corresponding improvements in outcomes (Martin et al, 2008). Major cost of LBP can be identified with the chronic and recurrent LBP (Kerry, 2010). Several approaches of management have been used in treating non-specific low back pain with varying degrees of success. Drugs have been widely accepted in managing acute LBP (Johnson, 2012). Physiotherapy is central to the overall management of LBP in the sub-acute and chronic phases (Johnson, 2012). Physiotherapy management of long term LBP favours active low back treatment programmes involving improving aerobic fitness, increasing the strength and flexibility of the lumbar musculature and ensuring lumbar stability (Steven et al, 2015). There are many physiotherapy modalities available for amelioration of LBP, some of them are: shortwave diathermy (Abdus-Shakoor, 2010), infrared rays (French et al, 2006), exercise therapy (Marianke, 2011), massage (Furlan et al, 2008), cryotherapy (French et al, 2006), transcutaneous electrical nerve stimulation (TENS) (Shealy, 1993, Khadilkar et al, 2008), interferential therapy, heat therapy, ultrasound, traction (Clarke et al, 2007), back care education (Heymans et al, 2004). It also involves the use of physical agents and modalities in physiotherapy to manage LBP. These include rest using supports e.g. lumbar corsets, heat therapy, cold

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