EFFECTS OF STABILIZATION EXERCISE ON PAIN, CROSS-SECTIONAL AREA AND MUSCLE THICKNESS OF LUMBAR MULTIFIDUS IN PATIENTS WITH CHRONIC LOW BACK PAIN

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THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, UNIVERSITY OF LAGOS IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DOCTOR OF PHILOSOPHY (Ph.D) DEGREE IN PHYSIOTHERAPY.

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DECLARATION

With the exception of duly acknowledged references. I hereby declare that this research work was carried out by me at the Department of Physiotherapy, College of Medicine of the University of Lagos, under the supervision of my supervisors and has not been submitted to any other institution for the purpose of obtaining another degree.

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SCHOOL OF POSTGRADUATE STUDIES

UNIVERSITY OF LAGOS

CERTIFICATION

This is to certify that the thesis:

"Effects of stabilization exercise on pain, cross-sectional area and muscle thickness of lumbar multifidus in patients with chronic low back pain"

Submitted to the School of Postgraduate Studies, University of Lagos for the award of the degree of

DOCTOR OF PHILOSOPHY (Ph.D)

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DEDICATION

This thesis is dedicated to all individuals with low back pain all over Nigeria, their families and care givers.

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ABSTRACT

Low Back Pain (LBP) is a highly prevalent problem and one of the main causes of disability in the society. About 80-90% of people suffer LBP during their lifetime and it is the second most frequent reason for visits to the physician. Although the aetiology is diverse, many causes have been related to weakness or injury of the soft tissue in the lumbar area. Different treatment modalities have been used in the treatment of LBP, but with temporary relieve of symptoms and lack of improvement of the atrophy of lumbar multifidus muscle which improves the stability of the lumbar spine.

This study investigated the effect of stabilization exercise on chronic pain, cross-sectional area and muscle thickness of Lumbar Multifidus (LM) muscle in patients with chronic low back pain.

A total of 122 patients (44 males, 78 females) with non-specific chronic low back pain (NCLBP) were recruited from Orthopaedic Clinic of Lagos University Teaching Hospital (LUTH), Idi- Araba, Lagos and National Orthopaedic Hospital Igbobi, Lagos. They were randomly assigned to four different groups (1, 2, 3 & 4) using computer generated numbers. The participants went through stabilization exercise only (Group 1) for 30 minutes twice weekly one day interval for 8 consecutive weeks, stabilization exercise for 30 minutes combined with Transcutaneous Electrical Nerve Stimulation (TENS) for 10 minutes (Group 2) twice weekly one day interval for 8 consecutive weeks, stabilization exercise for 30 minutes combined with TENS for 10 minutes and massage for 5 minutes (Group 3). Group 4 is the control that was placed on drug therapy. A randomized control study was adopted in this study. Measurement of Cross-Sectional Area (CSA) and muscle thickness of LM muscle, self perceived pain intensity, functional disability and fear were assessed using Ultrasound

machine (Mindray 2200), modified visual analogue scale, Oswestry disability questionnaire and fear avoidance belief questionnaire respectively at baseline, end of 4th week and end of 8th week. Data were analysed using statistical package for social science version17 and presented using descriptive statistics of mean and standard deviation. Kruskal Wallis test was used to analyse each of the outcome measure parameters and analysis of variance (ANOVA) was used to analyse the cross-sectional area (CSA) and thickness pre and post treatment intervention across the groups.

Patients in groups 1, 2 and 3 recorded significant reduction in pain severity, increased functional ability and decreased fear avoidance belief following intervention ($P<0.05$). Post hoc analysis revealed that the significance lies between group 1&4, group 2&4, groups 3&4 post intervention assessment. This reveals that the intervention used in the course of this study was effective in the management of patients with chronic low back pain. There was predominant increase in the CSA at 4th and 5th lumbar vertebrae only with more increment in group 1 with a mean and standard deviation of 11.85± 1.99 at 4th lumbar vertebrae and 12.10 ± 2.19 at 5th lumbar vertebrae. There was increase in the LM muscle thickness at L4-L5 post-intervention assessment with more increment in group 1 with a mean and standard deviation of 3.19 ± 0.69, within the three groups these shows that stabilization exercise alone and in combination with TENS and massage are effective in increasing the CSA and thickness of lumbar multifidus muscle in patients with non-specific chronic low back pain.

The study established that stabilization exercise only and in combination with TENS and massage is effective in managing patients with non-specific chronic low back pain (NCLBP). It was also established that assessment of CSA and muscle thickness of LM can be used as a measure of treatment improvement or progression in patients with NCLBP.