

Comparative Effect of Egoscue Exercises and Lumbar Stabilization Exercises in Asymptomatic Individuals with Lumbar Hyperlordosis

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ABSTRACT

Background and purpose: Hyperlordosis also known as swayback or hollow back is a condition involving an excessive c- shaped curve in the lower back or lumbar region, while lordosis refers to the natural inward curvature of the spine, hyperlordosis refers to the extreme curvature. Excessive curvature leads to pain, discomfort and numbness. The primary purpose of this experimental study was to determine the effect following the program of Egoscue corrective exercise as treatment for one group and lumbar stabilization exercise for another group in the management of lumbar hyperlordosis in asymptomatic individuals.

AIM: The aim of the study was to compare the effectiveness of egoscue exercises and lumbar stabilization exercises in asymptomatic individuals with lumbar hyperlordosis.

Methods: A sample of 30 patients within the age group 18-40 years with lumbar hyperlordosis were randomly divided into two groups, group A (n=15) and group B (n=15).

PROCEDURE: The subjects in group A was treated with Egoscue exercises and group B was treated with Lumbar stabilization exercises. The subject improved was assessed by degree of lumbar lordosis scale and percentage of lumbar lordosis scale using index of lumbar lordosis. The pre and post test results were assessed.

RESULT: The study concludes that there was statistically significant reduction of lumbar hyperlordosis in group A and group B in response to treatment.

CONCLUSION: Based on the results, this study concluded that there was an improvement on lumbar hyperlordosis in both groups. Meanwhile, the effect of lumbar hyperlordosis is more effective in group A who received egoscue exercises than group B.

Keywords: Lumbar hyperlordosis, asymptomatic individuals, egoscue exercise, Lumbar stabilization exercises.

INTRODUCTION

Hyperlordosis also known as swayback or hollow back is a spinal condition involving an excessive c- shaped posterior curve in the lower back or lumbar region, where the spine curves inward just above the buttocks, while lordosis refers to the natural inward curvature of the spine, hyperlordosis refers to the extreme curvature. Hyperlordosis can

occur in all ages, but rare in children. It is a reversible condition. Lumbar hyperlordosis usually occurs due to sitting or standing in a poor posture for long period of time, muscle imbalance, obesity, improper movement, improper lifting, wearing high heels, osteoporosis, kyphosis or slouching and lack of exercise^[1].

When the lordotic angle of lumbar spine is more than 45° it is termed as hyper-lordosis. Excessive curvature leads to pain, discomfort and numbness. Symptoms of lumbar hyperlordosis usually occurs in lower back and a curved spine. Hyperlordosis in spine leads to muscle stiffness and tightness in the lower back. This ultimately damage the spine and soft tissues in the lumbar region. In hyperlordosis pelvic tilts anteriorly due to the weakness of Gluteus maximus and tightness of Iliopsoas^[2].

Exercises are the most common way to correct abnormal posture, with stretching of tight structure and strengthening of weak musculatures^[3]. Corrective exercises are used to improve posture by activating skeletal muscles to bring body segments closer to an ideal alignment^[4].

The Egoscue Method uses spinal corrective exercises to improve whole-body postural alignment by improving joint mobility and stability^[5]. The Egoscue Method involves inspecting a patient's posture, categorizing their posture into one of three spinal conditions according to their postural misalignments, and prescribing a corrective exercise program (i.e., E-cise menu) based on their condition and posture. The E-cise menu consists of 10 to 20 E-cises which may take upto 1 hours to complete exercise program on a daily basis^[6].

Lumbar stabilization exercises are targeted to improve neuromuscular control, strength and endurance of the spinal muscles that are located to maintain the dynamic spinal and trunk stability^[7] and also provides some mobility. To improve spinal segment instability, lumbar stabilization exercises work to strengthen the local muscle group located deep in the trunk around the lumbar vertebrae, which plays important role in providing dynamic stability for spinal segments, they are useful for relieving functional disability of the spine^[8]. Lumbar stabilization is important for maintaining the spine and performing extremity movements and is applied to adjust the imbalance

between the abdominal and trunk extensor muscles^[9].

The primary purpose of this experimental study was to determine the effect following the program of Egoscue corrective exercise as treatment for one group and lumbar stabilization exercise for another group in the management of lumbar hyperlordosis in asymptomatic individuals^[10].

METHODS

The study was conducted at outpatient department in JKKMMRF College of physiotherapy under supervision of concerned authority. A sample of 30 participants within the age group of 18 to 40 years with the lumbar hyperlordosis were randomly divided into 2 groups. A total number of 30 subjects were selected by random sampling method after due consideration to inclusion criteria and exclusive criteria. They were divided into two Groups. Group A and Group B with 15 participants in each group. Group A received egoscue exercises. Group B received lumbar stabilization exercises for a total duration of 4weeks, 3 times with 30 seconds hold time for 1st week, in alternative days / week, incremented to 5 times in each week. Hence 20 times with 30 second hold at 4th week. The parameters used for this study was degree of lumbar lordosis scale and percentage of lumbar lordosis scale using index of lumbar lordosis measured by flexible ruler^[11]. Both male and female are included in this study.

PARAMETERS

DEGREE OF LUMBAR LORDOSIS USING INDEX OF LUMBAR LORDOSIS (DLL) ^[12]:

A 40 cm Surveyor's flexi curve was used. It was molded to the curve of the spine and traced on a paper to calculate the index of lordosis.

Maximum width and the total length of the curve were measured.

FORMULA: $\theta^\circ = 4 (\text{arc tan } [2H/L])$,

L = Vertical line joining the T12 and S2 vertebrae

H = max width that is deepest part of the curvature.

PERCENTAGE OF LUMBAR LORDOSIS USING INDEX OF LUMBAR LORDOSIS (PLL)^[13]:

Same instrument and procedure as used for the degree of the lumbar lordosis except the formula used :

$$IL = \text{lumbar width} / \text{lumbar length} \times 100$$

PROCEDURE:

GROUP A (Egoscue exercises) :

Egoscue Exercises includes

- Static back alone and static back with breathing.
- Abdominal contraction in static back position.
- Abductor press.
- Static wall.
- Upper spinal twist.
- Pelvic tilts.
- Supine groin progression.
- Overhead extension.
- Elbow curls on wall.
- Air bench.

GROUP B (Lumbar stabilization exercises):

Exercise includes:

- Crook lying.
- Crook lying with one leg extended and resting down on couch.
- Supine lying with one knee flexed.
- Supine lying with both the legs extended and one leg raised.
- Prone lying with arms at the side and head turned to opposite side.
- Plank position.
- Quadruped position with head in neutral.
- Sitting on chair erect.
- Sitting erect on Swiss ball.

RESULTS AND TABLES:

Comparison of Degree of Lumbar Lordosis (DLL) between group - A and Group – B

The comparative mean values, mean difference, standard deviation and unpaired

‘t’ value between Group A and Group B on lumbar hyperlordosis in Degree of Lumbar Lordosis (DLL) scale.

DLL ^[14]	Mean	Mean Difference	Standard Deviation	Unpaired ‘t’ Value
Group A	37.73	6.33	2.66	5.58
Group B	44.07			

The unpaired ‘t’ value of 5.58 was greater than tabulated ‘t’ value of 2.05, which showed that there was statistically difference at 0.05 level thus there is a significant improvements regarding lumbar hyperlordosis reduction in participants in response to treatment in Group-A when compared to Group-B. Therefore, the study was rejecting the null hypothesis and accepting the alternative hypothesis.

Comparison of Percentage of Lumbar Lordosis (PLL) Measurement Between Group - A And Group – B

The comparative mean values, mean difference, standard deviation and unpaired ‘t’ value between Group A and Group B on lumbar hyperlordosis in percentage of lumbar lordosis measurement.

PLL	Mean	Mean Difference	Standard Deviation	Unpaired ‘t’ Value
Group A	10.2	1.67	0.74	4.91
Group B	11.87			

The unpaired ‘t’ value of 4.91 was greater than tabulated ‘t’ value of 2.05, which showed that there was statistically difference at 0.05 level thus there is a significant improvement regarding hyperlordosis reduction in participants with lumbar hyperlordosis in response to treatment in Group-A when compared to Group-B. Therefore, the study was rejecting the null hypothesis and accepting the alternative hypothesis.

DISCUSSION

The present randomized clinical trial was done to compare the effects of Egoscue exercises and lumbar stabilization exercises in individuals with lumbar hyperlordosis. The examination was taken to find the

relationship between lumbar lordosis, pelvic tilt and abdominal muscle performance during normal standing posture^[15]. The result from the statistical analysis showed that the Egoscue group was better in the reduction of lumbar lordosis and anterior pelvic tilt as compared to lumbar stabilization group.

In the analysis and interpretation of DLL in Group A and Group B

The unpaired 't' value of 5.58 was greater than tabulated 't' value of 2.05, which showed that there was statistically difference at 0.05 level thus there is a significant improvements regarding lumbar hyperlordosis reduction in participants in response to treatment in Group-A when compared to Group-B.

In the analysis and interpretation of PLL in Group – A and Group – B

The unpaired 't' value of 4.91 was greater than tabulated 't' value of 2.05, which showed that there was statistically difference at 0.05 level thus there is a significant improvements regarding hyperlordosis reduction in participants with lumbar hyperlordosis in response to treatment in Group-A when compared to Group-B.

Therefore, the study was accepting the alternative hypothesis rejecting null hypothesis.

CONCLUSION

Based on the statistical analysis, the result of this study showed that there was significant improvement in both groups between pre and post tests. The unpaired 't' value for Degree of lumbar lordosis was 5.58 at 0.05 levels, which was greater than the tabulated 't' value (2.05). Thus the results showed that subjects who participated in group A showed good improvement in decrease in lumbar hyperlordosis than the group B.

The study concluded that the egoscue exercises was more beneficial for lumbar

hyperlordosis correction than lumbar stabilization exercises.

Declaration by Authors

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