A Comparative Study Between The Effectiveness Of Back Strengthening Exercises Versus Segmental Stabilizing Exercises To Improve Functional Disability Among Working Women With Chronic Low Back Pain

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ABSTRACT

AIMS AND OBJECTIVES: To compare between the effectiveness of back strengthening exercises versus segmental stabilizing exercises to improve functional disability among working women with chronic low back pain.

METHODOLOGY: 30 patients with chronic low back pain were randomly selected according to inclusion and exclusion criteria and divided into two groups – Group A: treated with back strengthening exercises, Group B: treated with segmental stabilization exercises.

RESULT: In our study both the groups showed statistically significant results but in comparison, the group treated with segmental stabilization exercise showed a significant effect on reducing the scores of both the outcome measures (VAS & OLBPDQ) than the group treated with traditional back strengthening exercises.

CONCLUSION: This study concludes that segmental stabilizing exercises is more effective in comparison to back strengthening exercises for improving functional disability among working women with chronic low back pain.

KEYWORDS: chronic low back pain, core stability exercises, strengthening excercises, low back exercises

INTRODUCTION Low back pain(LBP) is defined as pain or discomfort in the lumbosacral region, localised below the last rib and above the gluteal crease, with or without referred leg pain.[1] While LBP can result from known or unknown abnormalities or diseases,[2] in more than 85 % of cases LBP is considered non-specific.[3]

Most episodes are short-lasting and without, or with little lasting consequences, recurrent episodes are common and LBP is increasingly being understood as a long-lasting condition with varying trajectories.[2]

Low back pain is usually categorized in 3 subtypes: acute, sub-acute and chronic low back pain. This subdivision is based on the duration of the back pain. Acute low back pain is an episode of low back pain for less than 6 weeks, sub-acute low back pain between 6 and 12 weeks and chronic low back pain for 12 weeks or more.[4] Low back pain that has been present for longer

than three months is considered chronic. More than 80% of all health care costs can be attributed to chronic LBP (CLBP).

Prevalence: Lbp is one of the most common musculoskeletal disorders in modern society with a global point prevalence of 9.4 %[5], LBP is a leading cause for disability and work absence[5,6,7], and causes considerable burden on individuals, their families, the economy, and health care systems [8]. Various interventions are used for effective treatment of LBP. The management of LBP comprises a range of different interventional strategies, including drug therapy and nonmedical interventions. Nonsteroidal anti-inflammatory drugs may be of short-term benefit and are included in medical management, whereas physical therapy includes pain control with different modalities like S.W.D, T.E.N.S, I.F.T, cupping, K-taping & rehabilitation with different physical exercises to enable activities of daily living.

This review has the purpose of highlighting the evidence supporting the different rehabilitative techniques described for its management. The effect of exercise therapy was examined through changes in the main clinical outcomes (pain, disability,) quality of life (QoL) and the targeted aspects of physical function (muscle strength, mobility, muscular activity and flexibility).

All the techniques are effective for the study groups with respect to the control groups in reducing pain and disability and improving the QoL and maintaining benefits at follow-up; Exercises reduce pain and are more efficient than a pharmacological or instrumental approach in reducing disability. To date, it is difficult to affirm the superiority of one approach over another. Further high quality research is needed to confirm the effect of these techniques, together with the use of more appropriate evaluation measures.

METHODOLOGY This is a Comparative Study with a random sample design. Study consist of 30 Nos. office going women diagnosed with CLBP. It was conducted for 12 weeks (30 mins session/day, 5 days a week, for a total of 12 weeks)

INCLUSION CRITERIA Office going women in 30 to 50 yrs of age diagnosed with chronic low back pain were included in the study.

EXCLUSION CRITERIA cases with Any recent surgery or injury in back region, Rheumatologic disorders, Spine infections, Neurological disorder, Malignancy, High fever, Mental retardedness & Uncooperative patients were excluded from the trial.

OUTCOME MEASURES: Visual Analog Scale (VAS) & Oswestry low back pain disability questionnaire (OLBPDQ) were taken as outcome measures

MATERIALS USED : Written Consent Form ,General Assessment Form,Pen,Paper,Chair, Table,Couch,Mat,Ultrasound modality were used during the study

PROCEDURE: After collecting the written consent form the patients selected by inclusion and exclusion criteria, they were divided into two groups- group A and group B. Group A was treated with back strengthening exercises & group B was treated with segmental stabilization exercises

Both the groups were treated with therapeutic ultrasound for 10 mins, at intensity of 1.4 w/cm^2. After electrotherapy treatment the patients were given exercise protocol. The total session took about 30 mins.

Back Strengthening Exercises included

- isometrics,
- Pelvic bridging,
- extension exercises(spinal extension, leg extension in prone lying)
- graded flexion(knee to chest)
- Progressed to curl-ups

Segmental Stabilization Exercises included

- Isometric abdominal drawing in maneuver in crook lying,
- progressing to leg lifts with holding contraction.
- Quadruped Opposite Arm/Leg Raise for erector spinae or multifidus
- Bridge with Leg Abduction: a standard bridge with a leg abduction (lifting the leg to the side) to engage the glutes and stabilize the pelvis

Home exercises for low back pain was taught to the patients of both the groups.

Pre & Post values of outcome measuring tools were kept safely for analysing the data.

RESULTS After screening 40 patients for study eligibility, a total of 30 patients were included for analysis, of whom 15 were in the Group A (back strengthening exercises) and 15 were in the Group B (segmental stabilization exercises). Group A had a mean age of 40.53 years and Group B had a mean age of 40 years. The demographic data has been presented in tables and depicted in figure.

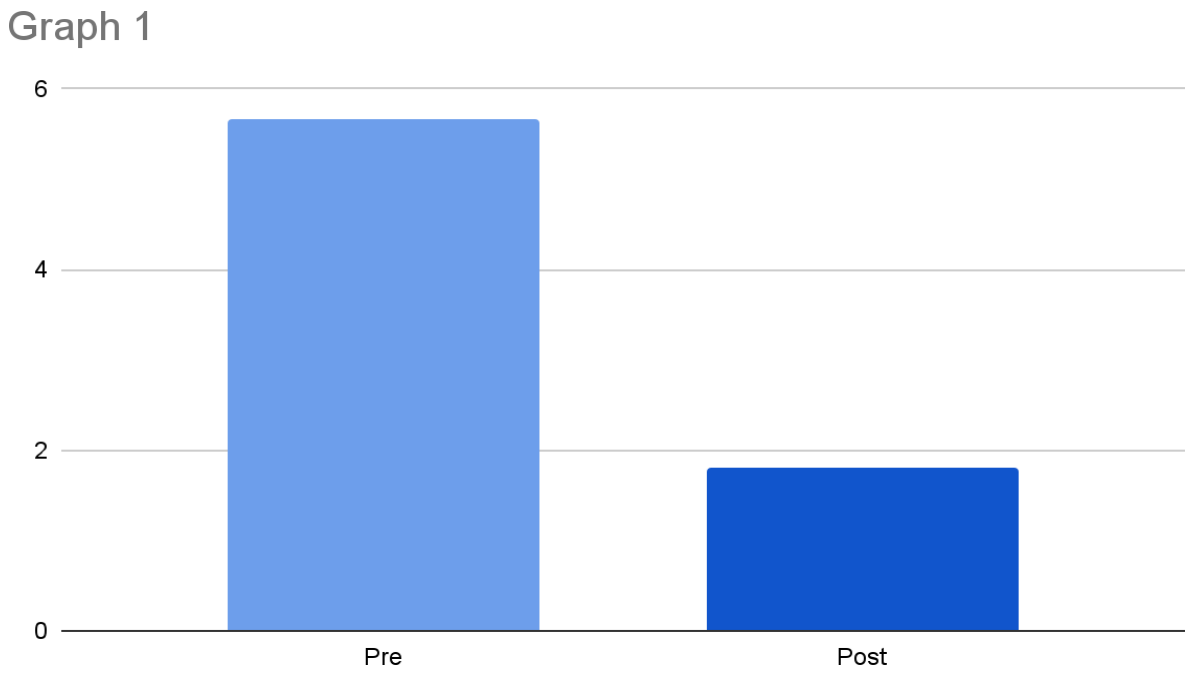
Table I. Patients clinical & demographic data, according to the group

Features	Group A (n=15)	Group B (n=15)
Mean age (yrs)	40.53	40
Weight (kg)	74.61	73.60
Height (cm)	1.67	1.65

Table 1. Analysis of pre & post test values of VAS within group A

VAS	N	MEAN	Std. Dev.	S.E.M	df	t	p
Pre	15	5.67	0.9759	0.2519	14	17.9603	<0.05*
Post	15	1.8	0.6761	0.1745			

*Significant (p<0.05)



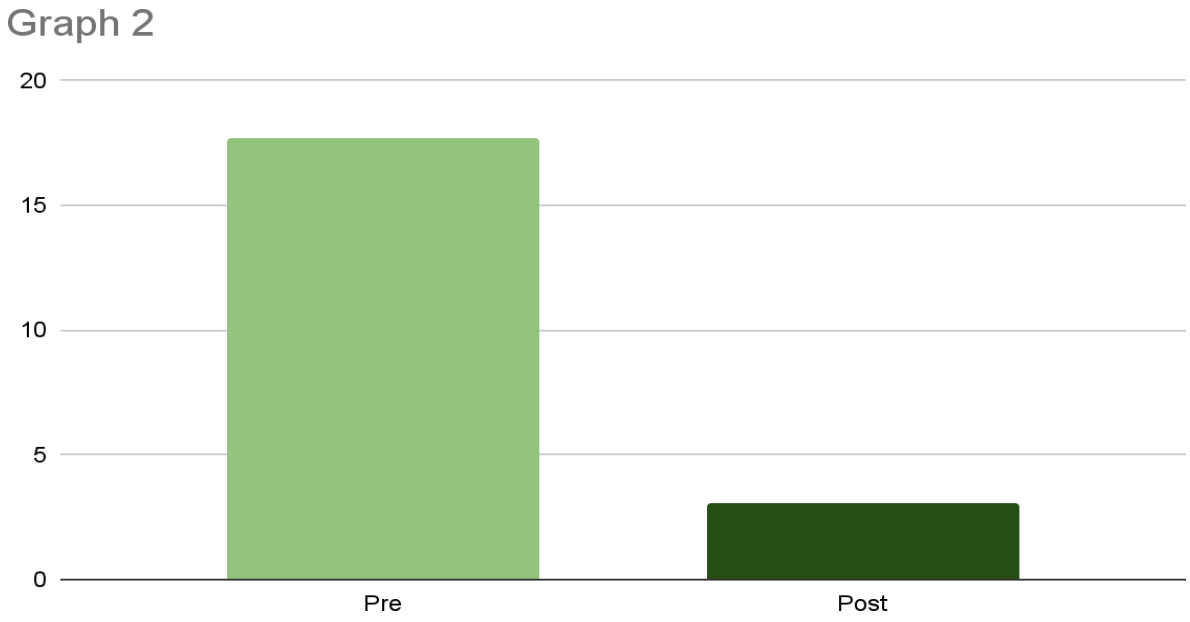
INTERPRETATION

Above table & graph shows the comparison of pre & post values of VAS within group A. The mean pre test score is 5.67, mean of post test score is 1.8. For paired t -test t value is 17.96 & p value is <0.05 which is significant.

Table 2. Analysis of pre & post test values of OLBPDQ within group A

OLBPDQ	N	MEAN	Std. Dev.	S.E.M	df	t	p
Pre	15	17.6666	2.5541	0.6594	14	32.0419	<0.05*
Post	15	3.0666	0.9611	0.2481			

*Significant (p<0.05)



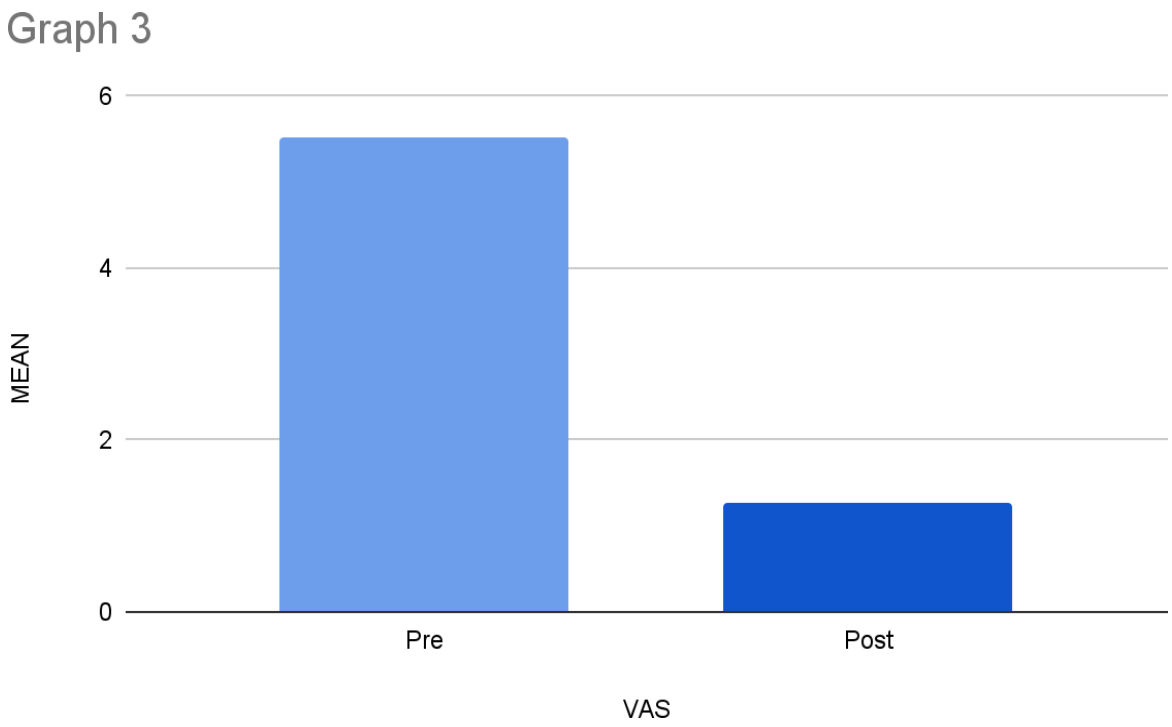
INTERPRETATION

Above table & graph shows the comparison of pre & post values of OLBPDQ within group A. The mean pre-test score is 17.67, mean post test score is 3.07. For paired t -test t value is 32.04 & p value is <0.05 which is significant.

Table 3. Analysis of pre & post test values of VAS within group B

VAS	N	MEAN	Std. Dev.	S.E.M	df	t	p
Pre	15	5.53	1.302	0.3361	14	18.6991	<0.05*
Post	15	1.2666	0.7037	0.1817			

*Significant (p<0.05)



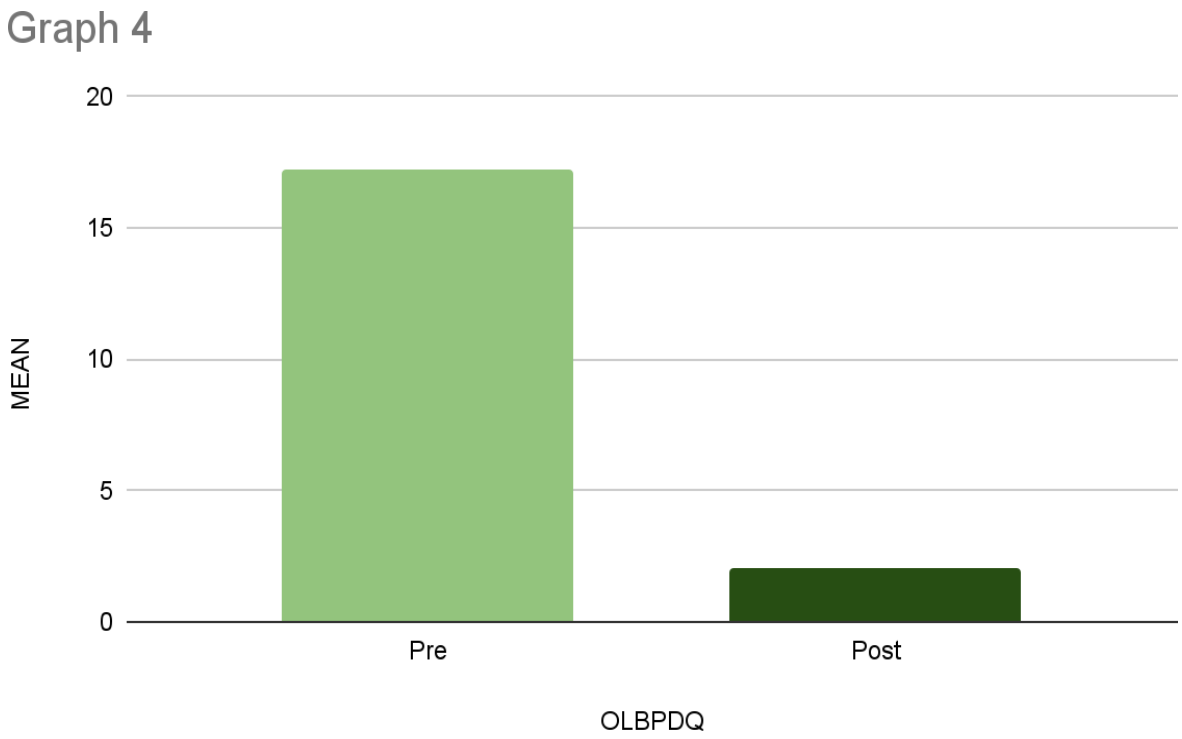
INTERPRETATION

Above table & graph shows the comparison of pre & post values of VAS within group B. The mean pre test score is 5.53, mean of post test score is 1.27. For paired t -test t value is 18.7 & p value is <0.05 which is significant.

Table 4. Analysis of pre & post test values of OLBPDQ within group B

OLBPDQ	N	MEAN	Std. Dev.	S.E.M	df	t	p
Pre	15	17.2666	2.5541	0.6594	14	26.6333	<0.05*
Post	15	2.0666	0.9611	0.2481			

*Significant (p<0.05)



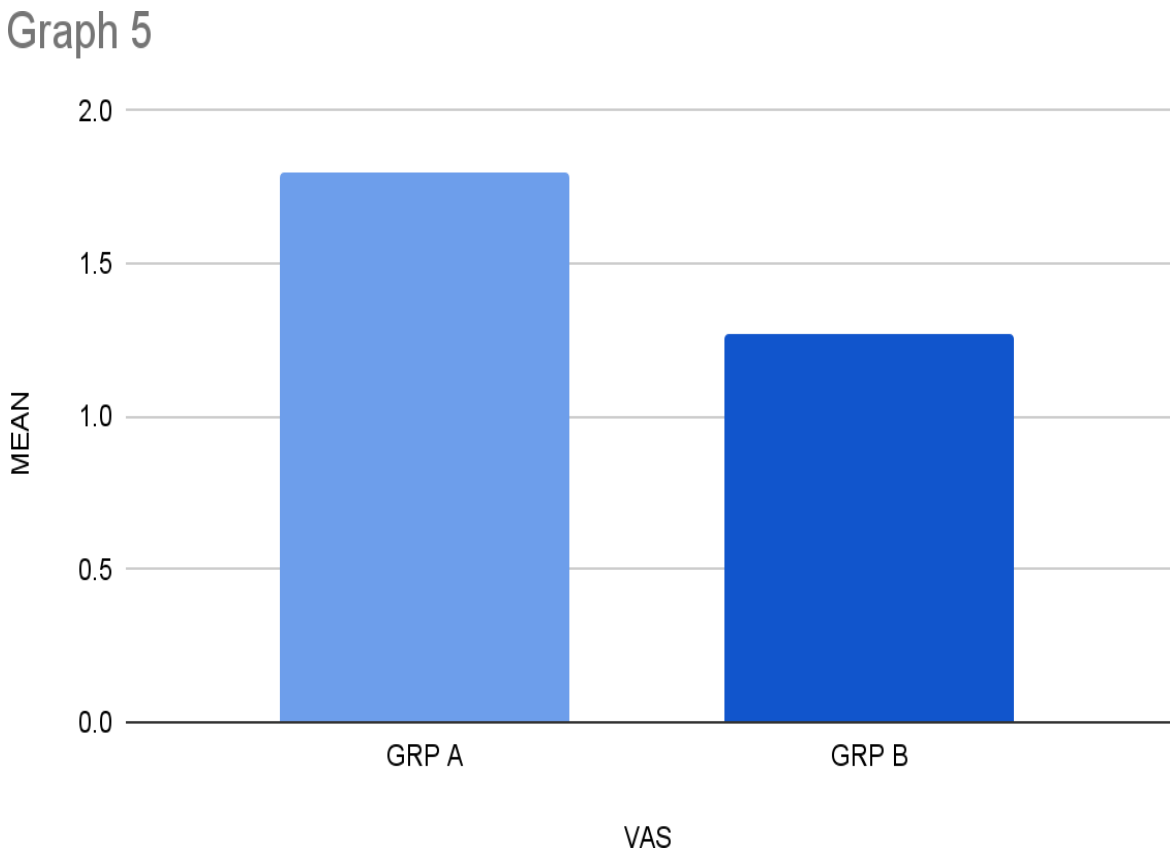
INTERPRETATION

Above table & graph shows the comparison of pre & post values of OLBPDQ within group B. The mean pre-test score is 17.2666, mean post- test score is 2.0666. For paired t -test t value is 26.6333 & p value is <0.05 which is significant.

Table 5. Analysis of post test values of VAS between group A & B

VAS	N	MEAN	Std. Dev.	S.E.M	df	t	p
GRP A	15	1.8	0.6761	0.1745	28	2.1166	<0.05*
GRP B	15	1.27	0.7037	0.1817			

*Significant (p<0.05)



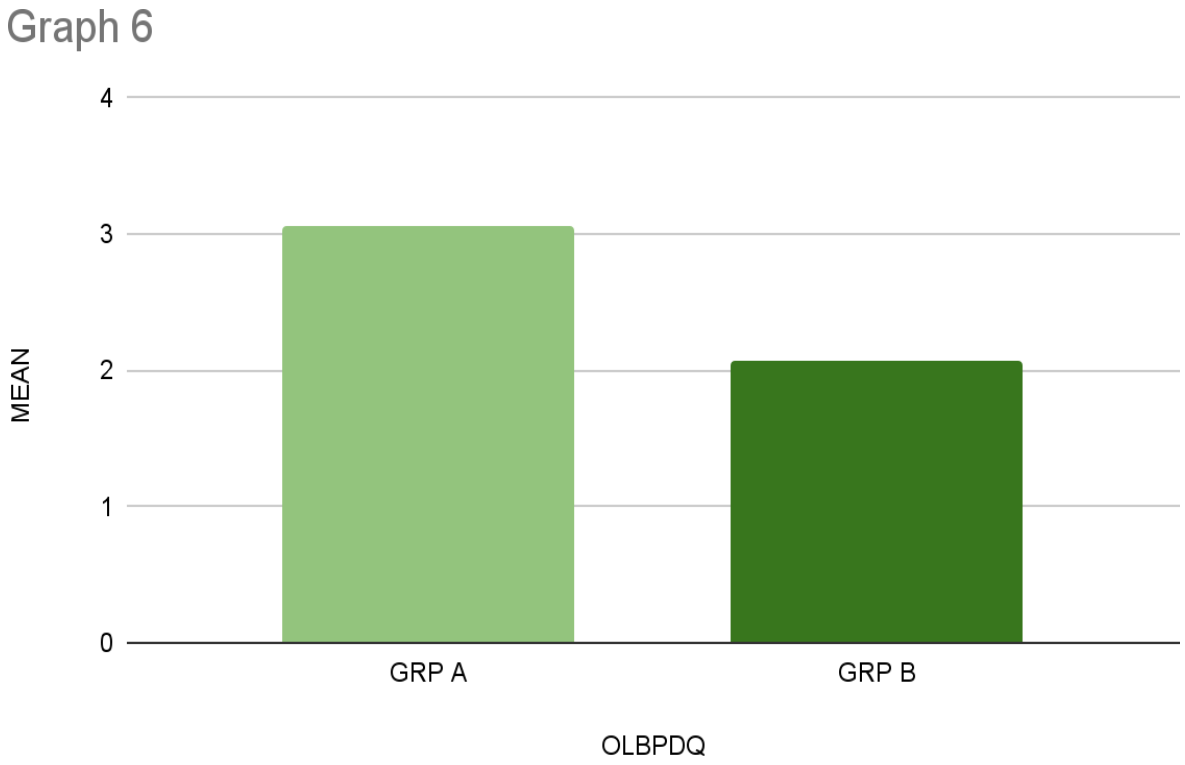
INTERPRETATION

Above table & graph shows the comparison of post test values of VAS between group A&B. The mean post test score of grp A is 1.8, mean of post test score is 1.27 For unpaired t -test t value is 2.12 & p value is <0.05 which is significant.

Table 6. Analysis of post test values of OLBPDQ between group A & B

OLBPDQ	N	MEAN	Std. Dev.	S.E.M	df	t	p
GRP A	15	3.0666	0.9611	0.2481	28	2.8493	<0.05*
GRP B	15	2.0666	0.9611	0.2481			

*Significant (p<0.05)



INTERPRETATION

Above table & graph shows the comparison of post treatment values of OLBPDQ between group A&B. The mean post test score of grp A is 3.07, mean of post test score of grp B is 2.07. For un-paired t -test t value is 2.85 & p value is <0.05 which is significant.

DISCUSSIONS

The aim of this study was to compare the effectiveness of traditional back strengthening exercises versus that of segmental stabilising exercises to improve functional disability in chronic low back pain. Both treatments were effective in relieving pain & in decreasing functional impairment.

Our findings suggest that segmental stabilization exercises reduce subject's pain more effectively immediately after the end of treatment protocol over general back strengthening exercise protocol with statistical significance. The stabilizing exerxise treatment approach was more effective than other conservative treatment approaches which mainly involved conventional exercise programs. This could be explained with the following possible reasons.

Firstly, the stabilization exercise uses the drawing-in maneuver which helps in coactivating the transversus abdominis and multifidus muscles than other exercises which concentrate on strengthening the surrounding muscle. The drawing-in maneuver develops the pattern of setting the deep abdominal and multifidus in feedforward pattern and helps to maintain the holding capacity and in coordination with the global muscles.

Secondly, tactile facilitation along with verbal cues were also given to explain the muscles encircling the trunk which acts as feedback and

Third reason may be that all the exercises were performed consecutively one after the other without any repetitions and no rest period was given to maintain the posture. This helps to sustain the co-contraction of the muscle while performing the exercise. Primary training in crook lying (70°–90° of knee flex- ion) is slowly progressed to prone lying to sitting followed by functional activities. Extremity motions were added and were used to stimulate muscle endurance and strengthen the trunk muscles. In prone position the load to lumbar spine increases on extremity loading hence extension exercise were initiated in quadruped position to maintain lumbar in neutral position and for patient to learn control. The quadratus lumborum acts as a stabilizer in frontal and transverse plane. Hence side propping position was maintained to activate quadratus lumborum and external oblique. The same recruitment of muscle can be

taught to patients by self-palpation and sitting and rocking on a swiss ball. For this reason, stabilization exercises can be included in home programs. Lumbar stabilization exercise also strengthens the lumbar extensors thereby improving functional ability and lumbar range of motion.

Both the exercise groups showed statistical significance but the “stabilization exercise” exercise group showed more significance over the general exercise group in reducing pain in chronic low back pain. So specific stabilization exercise was superior in the improvement of pain and reduction of disability than the general exercise group.

For the lumbar stabilization group, score changes for VAS & OLBPDQ were significant within the group. However when between group study was done and lumbar stabilization group was compared to the one with traditional strengthening excercise group, the pain was found to be significantly reduced in the lumbar stabilization group with P-value less than 0.05 compared to strengthening exercise. OLBPDQ scores were found to be significantly reduced with P-value less than 0.05 when compared to the strengthening group.

The back strengthening grp, score changes for VAS,OLBPDQ were more significant within the group. However when between the group analysis was done and the back strengthening group was compared to the other group, the pain significantly reduced in the stabilization group compared to the traditional back strengthening group. When disability was assessed, the OLBPDQ score was significantly reduced with P-value less than .05.

CONCLUSIONS

The result of the study concludes that both the group showed significant effect on chronic low back pain but the group treated with segmental stabilization exercises was found significantly more effective than back strengthening exercises after 12 weeks of interventions.

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