



EFFECTIVENESS OF LUMBAR STABILIZATION EXERCISES V/S WALKING ON MECHANICAL LOW BACK PAIN IN POWER-LOOM WORKERS

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Abstract: AIM: To study the effectiveness of lumbar stabilization exercises v/s walking in mechanical low back pain in power loom workers.

NEED OF STUDY: This study is intended to compare the lumbar stabilization exercises therapy v/s walking on mechanical low back pain in power loom workers and finding which treatment is more effective.

METHODOLOGY: This comparative study was conducted over a period of six months in textile industries situated in and around Pune, focusing on power loom workers. The study utilized a convenient sampling method to select a sample size of 72 participants. Employing a two-group pretest-posttest design, the methodology aimed to investigate the effectiveness of certain interventions or factors on the well-being or productivity of power loom workers. This design allowed for a comparison between two groups over time, providing insights into any changes observed. The study's focus on power loom workers underscores the relevance of addressing occupational health and productivity concerns within the textile industry, particularly in regions like Pune with a significant presence of such manufacturing units.

RESULT: Est power loom workers, lumbar stabilization exercises are more beneficial than walking in lowering mechanical low back pain and functional disability.

CONCLUSION: This study concludes that lumbar stabilization exercises is more effective than

Walking in reducing mechanical low back pain and functional disability in power loom workers.

DISCUSSION The study compared the effectiveness of lumbar stabilization exercise versus walking in reducing mechanical low back pain among power loom workers. Results demonstrated significant improvements in pain and functional disability after both interventions. with lumbar stabilization exercise showing slightly greater efficacy. However, both treatments proved clinically effective, underscoring the importance of supervised exercise therapy as a primary approach for managing chronic non-specific low back pain.

Index Terms – Stabilization exercises, Power loom workers, Mechanical Low back Pain

I. INTRODUCTION

Typical activity performed by power loom industry is:

Winding Threading Spinning knitting weaving bleaching dyeing finishing. ^[1] Total prevalence of low back pain in power loom workers is 58 % Since the workers behavior is static and repetitive, they may develop unchanging or forced body posture, continued repetitive movements and compressed force on spine, lower back, without enough recovery time.^[1] The power loom workers need to maintain such awkward posture for long time. The estimated time of workers to maintain such posture is about 8 hours a day, which can largely cause stress on their lumbar spine and lower trunk muscle.

Low back pain is the most common MSK disorders with prevalence rate of 80%.^[2] LBP is associated with histomorphology and structural changes in the paraspinal muscles. These back muscles are smaller, contain fat, and show a degree of atrophic changes in select muscle fibers. ^[3] Therefore, the lumbar paraspinalis muscles are weak with excessive fatigability. ^[3,4] Furthermore, poor coordination of the paraspinalis muscles has been associated with chronic LBP. ^[5] These contribute to a vicious cycle of LBP. Mechanical low back pain refers to back pain that arise from the spine, intervertebral disc, or surrounding soft tissues. ^[6] Repetitive trauma and overuse are most common causes of chronic mechanical low back pain, which is often secondary to workplace injury. ^[7] A person with mechanical low back pain avoids any physical activity which causes disuse atrophy of the lumbar muscles and decreases strength and hence increases pain ^[8]

Lumbar Stabilization Exercise is primarily aimed at improving neuromuscular control, strength, and endurance of the muscles, which are considered to be central to the maintenance of dynamic spinal and trunk stability.^[9] Lumbar stabilization is the stabilization that is achieved internally by isometric contraction of the core muscles.^[10] The motive of LSE is to gain control of muscles and their movement. ^[11]

Walking is widely accepted as a good choice for general back exercise and rehabilitation programs, as it strengthens the back muscles and reduces rigidity of motion.^[12] WE induce isometric contractions by increasing muscular activation, which may eventually lead to the prevention of LBP.^[13] Previous study showed that fast WE activate lumbar multifidus muscles more than slow WE and that increasing walking slope activates the mid-lumbar muscles more than lower lumbar muscles. Prolonged activation of lumbar paraspinal muscle have muscular strengthening effects.

II. NEED FOR STUDY

- The prevalence of low back pain is more (58%) in power loom workers.
- Very few studies are done on low back pain in power loom workers.
- The effectiveness of lumbar stabilization exercises and walking in mechanical low back pain has been studied individually, but the comparison between both of them is not done yet.
- This study is intended to compare the lumbar stabilization exercises therapy v/s walking on mechanical low back pain in power loom workers and finding which treatment is more effective.

III. AIM

To study the effectiveness of lumbar stabilization exercises v/s walking in mechanical low back pain in power loom workers.

IV. OBJECTIVE

- To find the effect of lumbar stabilization exercises in mechanical low back pain in power loom workers using NPRS and OSWESTRY DISABILITY INDEX at the end of 6 weeks program.
- To find the effect of walking in mechanical low back pain in power loom workers using NPRS and OSWESTRY DISABILITY INDEX at the end of 6 weeks program.
- To compare the effect of lumbar stabilization exercises and walking in mechanical low back pain in power loom workers using NPRS and OSWESTRY DISABILITY INDEX at the end of 6 weeks program.

V. HYPOTHESIS

5.1 Null Hypothesis (H1 0):

There will not be any significant difference of lumbar stabilization exercises and walking exercise alone on pain in power loom workers at the end of 6 weeks of intervention.

5.2 Alternate Hypothesis

(H1 A): There will be significant difference of lumbar stabilization exercise than walking exercise alone on pain in power-loom workers at the end of 6 weeks of intervention.

(H1 B): There will be more effect of Lumbar stabilization exercises than walking exercise alone on pain in power loom workers at the end of 6 weeks of intervention.

(H2 C): There will be more effect of walking exercise than Lumbar stabilization exercises alone on pain in power loom workers at the end of 6 week of intervention.

5.3 NULL HYPOTHESIS (H2 0): There will not be any significant difference of lumbar stabilization exercises and walking exercise alone on functional disability in power loom workers at the end of 6 weeks of intervention.

5.4 Alternate Hypothesis:

(H2 A): There will be significant difference of lumbar stabilization exercise than walking exercise alone on functional disability in power-loom workers at the end of 6 weeks of intervention.

(H2 B): There will be more effect of Lumbar stabilization exercises than walking exercise alone on functional disability in power loom workers at the end of 6 weeks of intervention.

(H2 C): There will be more effect of walking exercise than Lumbar stabilization exercises alone on functional disability in power loom workers at the end of 6 week of intervention.

I. METHODOLOGY

- SAMPLE SIZE: 72
- STUDY TYPE: comparative study
- STUDY DESIGN: Two groups pretest- posttest design
- SAMPLING METHOD: convenient sampling
- STUDY POPULATION: power loom workers
- STUDY SETTING: textile industries in and around Pune.
- STUDY DURATION: 6 months

VI. MATERIALS

- Yoga mat
- Pen
- Paper
- Data collection sheets
- Outcome measure (NPRS and ODI)
- Consent forms

VII. CRITERIA

7.1 Inclusion Criteria

- Power loom workers of age 25-50 years with low back pain of >3 months.
- Only males
- Workers who are willing to participate in the study.
- Mild pain according to NPRS (<5)

7.2 Exclusion Criteria

- Workers with recent injury and fracture.
- Any diagnosed neurological condition
- Deformity like scoliosis.
- History of recent lumbar or abdominal surgery, knee or hip arthritis, and pregnancy.
- Congenital deformities.

VIII. OUTCOME MEASURES

- NUMERIC PAIN RATING SCALE



- OSWESTRY DISABILITY

IX. PROCEDURE

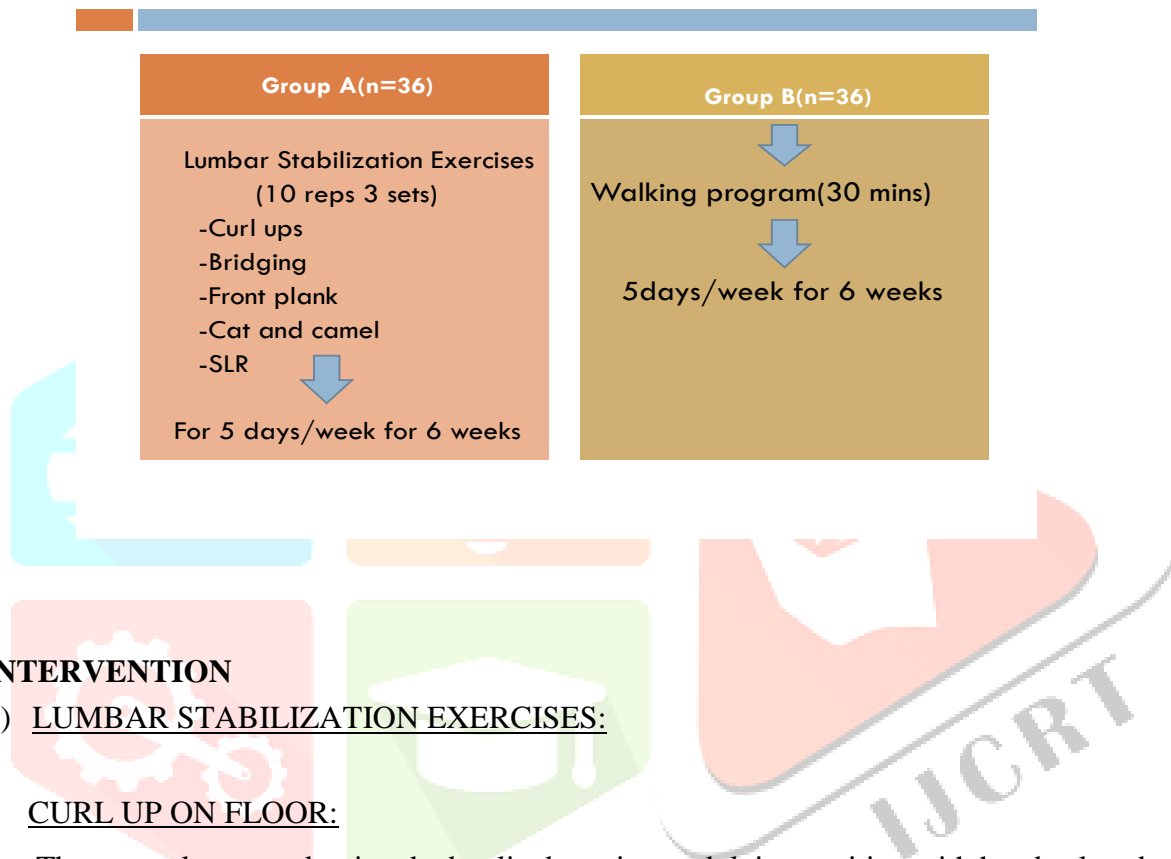
The study began with the presentation of synopsis to an ethical committee and after gaining approval from pes modern college of physiotherapy.

The various textile industries were visited in and around Pune. The subjects were selected on the basis of their inclusion and exclusion criteria

The assessment was done prior to the treatment.

The subjects were explained about the study. Consent was taken from the patient who wished to participate in the study and who are fitting in the inclusion criteria.

Subjects were assured that the collected information will not be misused in any form.



X. INTERVENTION

1) LUMBAR STABILIZATION EXERCISES:

• CURL UP ON FLOOR:

The power loom worker is asked to lie down in crook lying position with hands placed at the side. From this position, the worker will be told to lift his head, and neck up such that the scapula will be above the ground and tension is felt in the abdominals. This position should be held for a second and the same is repeated ten times for three sets.



- BRIDGING ON THE FLOOR:

The worker is asked to lie down in crook lying position with hands placed at the side of his body . From this position, the worker will be told to weight bear on his legs and lift his pelvis. This position will be held for a second and the same will be repeated ten times for three sets.



- FRONT PLANK ON THE FLOOR:

The worker is asked to lie prone on his elbows. He was then told to lift his body such that the shoulder, the back, and the pelvis should be in one straight line. This position is held for 10 seconds, and ten repetitions should be performed of the same for three sets.



- STRAIGHT LEG RAISE ON THE FLOOR:

The worker is asked to lie down in the supine position with hands at the side of the body. He is asked to lift one leg with the knee straight and heel facing forward. This is repeated ten times for one leg, and then the same was done for the next leg. This will be done for three sets



- CAT AND CAMEL ON THE FLOOR:

The worker is asked to go into quadruped position and arch his back up and head down such that they depict a camel. After that, the worker is asked to relax his back and arch it downwards with his/her head facing upwards. Each position will be held for 5 seconds, and the same will be repeated ten times for three sets.



2) WALKING EXERCISE:

The WE group will be performing fast walking.

It will be done on flat ground with abdominal bracing for 30 minutes.

XI. DATA ANALYSIS

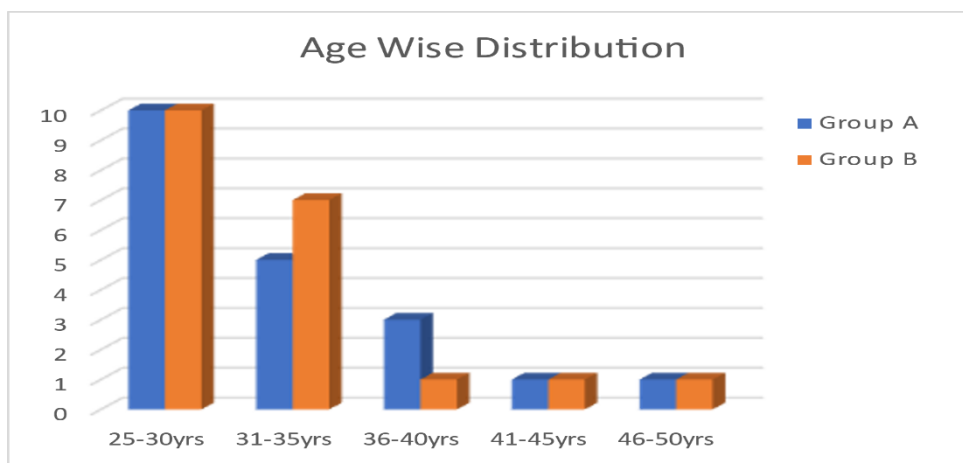
- Data was analyzed using Graph pad instant Paired t-test is used to analyze the difference between pre and post treatment Score and unpaired t-test is used to analyze the post treatment score of both the groups.
- The data was entered in Excel spreadsheet, tabulated and subjected to statistical analysis.
- Various statistical measures such as mean, standard deviation (SD) and test of significance were utilized to analyze the data.

XII. RESULT

40 power-loom workers of age 25 to 50 years with mechanical low back pain volunteered to participate in the study and have completed 6weeks of program.

Age Wise Distribution	Group A	Group B
25-30yrs	10	10
31-35yrs	5	7
36-40yrs	3	1
41-45yrs	1	1
46-50yrs	1	1

Table no.1: Demographic data (Age wise distribution of subjects in both Group A and Group B)



GROUP A

Table 2: Comparison of pre and post NPRS score of Group A

Table 3: Comparison of pre and post ODI score of Group A

PARAMETERS	PRE TEST		POST TEST		T VALUE	P VALUE	RESULT
	MEAN	SD	MEAN	SD			
ODI	18.85	±3.93	6.35	±2.36	12.167	<0.0001	EXTREMELY SIGNIFICANT

PARAMETERS	PRE TEST		POST TEST		T VALUE	P VALUE	RESULT
	MEAN	SD	MEAN	SD			
NPRS	3.55	±0.51	0.85	±0.58	15.521	<0.0001	EXTREMELY SIGNIFICANT

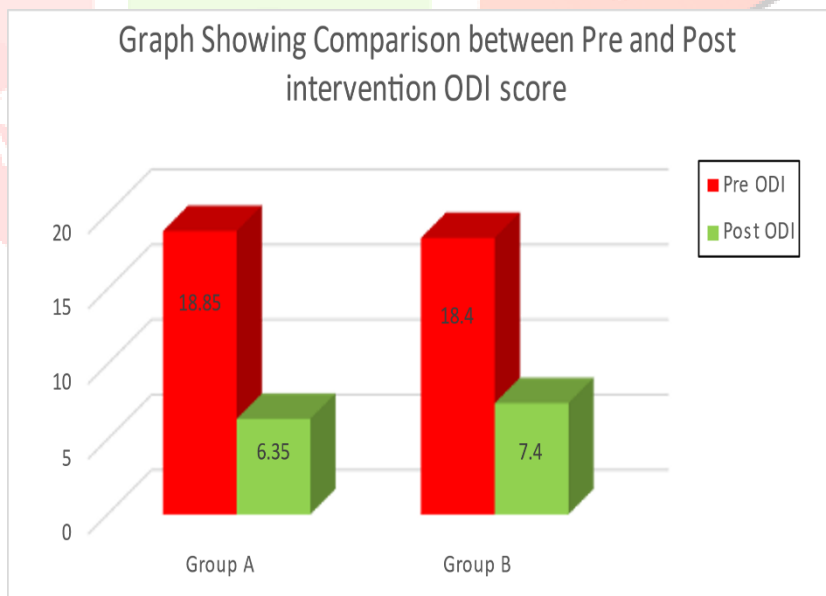
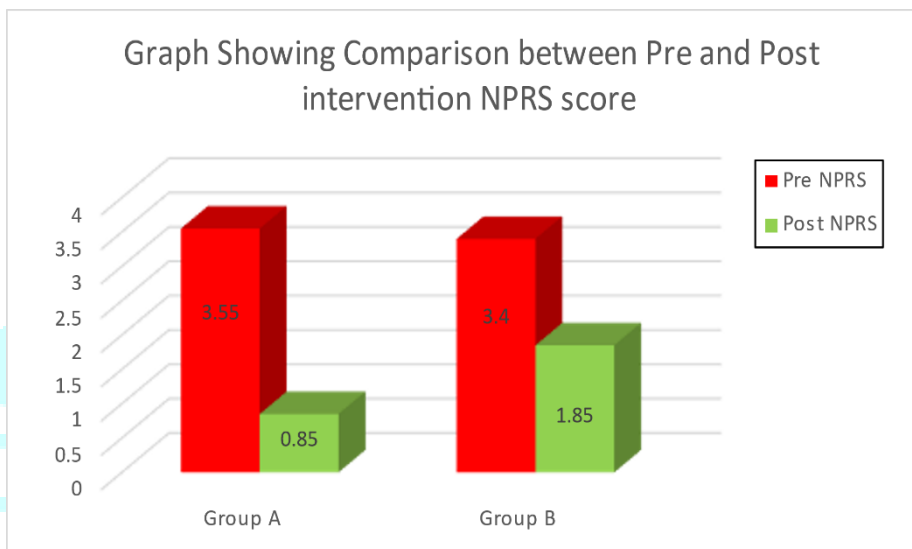
GROUP B

Table 4: comparison of pre and post NPRS score of Group B

PARAMETERS	PRE TEST		POST TEST		T VALUE	P VALUE	RESULT
	MEAN	SD	MEAN	SD			
NPRS	3.4	±0.502	1.85	±0.587	8.969	<0.0001	EXTREMELY SIGNIFICANT

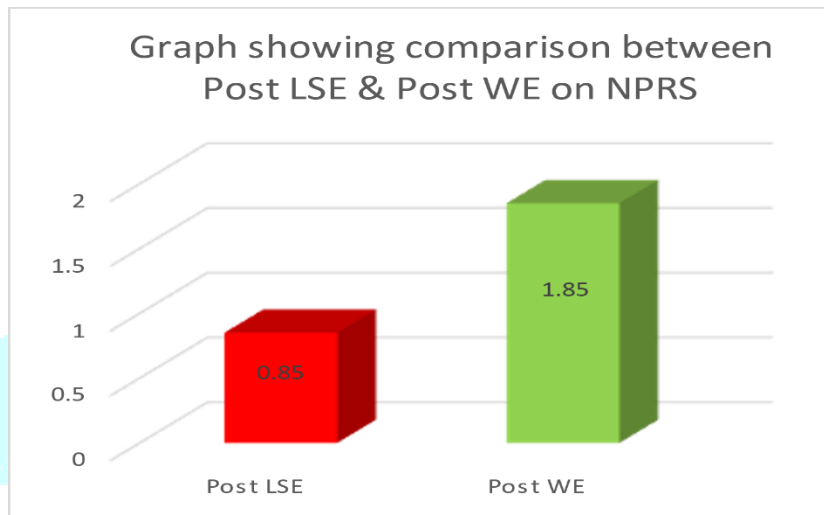
Table 5: Comparison of pre and post ODI scores of group B

PARAMETERS	PRE TEST		POST TEST		T VALUE	P VALUE	RESULT
	MEAN	SD	MEAN	SD			
ODI	18.4	±3.267	7.4	±3.085	10.948	<0.0001	EXTREMELY SIGNIFICANT



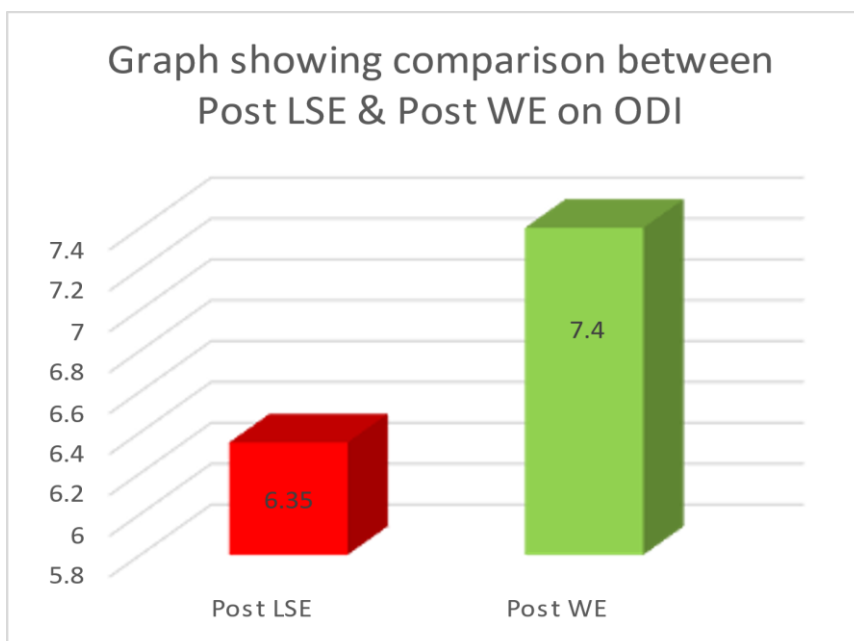
INTER-GROUP ANALYSIS FOR NPRS

PARAMETERS	POST LSE		POST WE		T VALUE	P VALUE	RESULT
	MEAN	SD	MEAN	SD			
NPRS	0.85	±0.58	1.85	±0.58	5.386	<0.0001	EXTREMELY SIGNIFICANT



INTER-GROUP ANALYSIS FOR ODI

PARAMETERS	POST LSE		POST WE		T VALUE	P VALUE	RESULT
	MEAN	SD	MEAN	SD			
ODI	6.35	±2.36	7.4	±3.085	1.207	0.2347	NOT SIGNIFICANT



XIII. DISCUSSION

This study intended to find the effectiveness of lumbar stabilization exercise v/s walking on mechanical low back pain in power-loom workers. All the 40 subjects included in this study had completed six weeks of treatment protocol. The patients showed statistically significant reduction in pain and functional disability after six weeks protocol of lumbar stabilization exercise and walking.

Lumbar stabilization exercises has the capacity to control the strength of movement when the posture is unstable it controls movement to maintain a neutral spine, a position of the spine that can best adapt to the load of the spine and it tend to cause the activation of muscles while performing task.

LSE is primarily aimed at improving neuromuscular control and strength of the muscles which maintain the dynamic trunk stability. These exercises mostly focused on activation of deep trunk muscles which eventually leads to increase in strength of muscles.

Moon et al reported in their comparative study on effect of lumbar Stabilization and dynamic lumbar Strengthening exercises that, functional improvement and lumbar extensor strength was better after LSE.

WE is widely accepted as a good choice for general back exercise ad rehab programs

In the present study, we recommended fast walking while maintaining proper posture because previous study showed that fast WE activates lumbar multifidus muscles more than slow WE and that increasing walking slope activates the mid-lumbar muscles more than lower lumbar muscles.

According to the study results Lumbar stabilization Exercise group were found to be more effective than the Walking Exercise to reduce pain, and functional disabilities. The statistical reading of the data shows that there was reduction in pain, Functional disabilities in both the groups (A and B). But there was more effect seen in the group A than in the group B. One of the possible causes of LBP is tightness. The possible reason could be Flexibility exercises were not included as part of WE programmed.

However clinically both the treatments were effective. In particular, the supervised exercise therapy is recommended by the European Guidelines for Management of Chronic Non-Specific LBP as the first-line treatment. (20) However, these guidelines do not recommend a particular exercise; hence, the choice of exercise for chronic LBP largely depends on the preferences of patients and/or therapists, as well as cost and safety. (21,24)

It is important for an exercise therapy to be simple, cost-effective, and easy to perform to maximize compliance. Muscle produces physiological toxins which contract and expand and can accumulate within the lower back muscles and cause stiffness. Walking opens up the blood vessel, increase supply of nutrients and oxygen to muscles. Hence in this study, Lumbar stabilization Exercise was significantly better than Walking program, but clinically both were equally effective

XIV. CONCLUSION

Study concludes that lumbar stabilization exercises is more effective than Walking in reducing mechanical low back pain and functional disability in power loom workers.

XV. LIMITATION

- The study is short duration study.
- This study was done on a small group.
- The drug type and potency were not considered in this study.

XVI. FUTURE SCOPE

- Larger sample size can be taken.
- Female population can be included.
- Progression of the exercises can be done.

XVII. REFERENCES

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