



**IMMEDIATE EFFECT OF LUMBAR CORSET ON BALANCE IN CHRONIC LOW BACK PAIN PATIENTS**

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Low back pain, balance, lumbar corset, hip strategy.

**ABSTRACT**

**Objective:** To assess the immediate effect of lumbar corset on balance in chronic low back patients.

**Background:** Back pain is an extremely common human phenomenon; a price mankind has to pay for their upright posture. According to one study, almost 80% of persons in modern industrial society will experience back pain at some time during their life. . Decrease of the mobility and stability of the waist occurs in these patients, and these bring about a decline of muscle strength and coordination capability and a change in proprioception. These disabilities of the musculoskeletal system affect balance performing ability and limit use of a proper exercise strategy in perturbation. Balance impairments are seen in chronic low back pain patients. Utilization of hip strategy will be reduced in low back pain patients. Lumbar brace exerts the necessary degree of compression in the lumbar region and achieves correction of sagittal plane spine balance to improve postural control of the lumbar spine.

**Methodology:** 45 samples were taken with low back pain between 4-6 months. Consent form was taken. .Balance was assessed using the Functional Reach test (FRT). To assess the balance patients were made to stand against the wall with shoulder flexed to 90 degrees. They were asked to move forward as much as possible without moving their feet. Readings were noted. Three such readings were taken and mean was calculated. The same procedure was repeated by making the patient wear lumbar corset and mean of three readings were calculated.

**Result and Conclusion:** Total score was calculated and the results were interpreted. The results showed that out of the 45 subjects that were assessed 39 showed improvement while the remaining 6 did not. Hence this study concluded that immediate use of lumbar corset helps in improving balance in chronic low back pain.

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**INTRODUCTION**

Back pain is an extremely common human phenomenon; a price mankind has to pay for their upright posture. According to one study, almost 80% of persons in modern industrial society will experience back pain at some time during their life. Fortunately, in 70 percent of these, it subsides within a month. But, in as many as 70 percent of these (in whom pain had subsided), the pain recurs.<sup>3</sup>

Low back pain brings about a decline in physical activity due to difficulties faced in daily living and emotional stress. It has negative effects such as muscle atrophy, decrease of muscle strength and bone density, and deformation of the musculoskeletal system through loss of the balance of the normal spine.<sup>2</sup>

Patients with low back pain are given improper sensory information on the location of the body in relation to gravity and supporting surfaces due to changes in the character and quantity of proprioceptive inputs from muscle spindles, Golgi tendon organs, joints, and skin receptors. Problems occur in the somatosensory system of patients with chronic low back pain. Decrease of the mobility and stability of the waist occurs in these patients, and these bring about a decline of muscle strength and coordination capability and a change in proprioception. These disabilities of the musculoskeletal system affect balance performing ability and limit use of a proper exercise strategy in perturbation.<sup>2</sup>

Balance impairments are seen in chronic low back pain patients. Recent evidences indicate that impaired trunk control is seen in LBP which compromise to trunk and hip movements during postural adjustments (i.e. hip strategy). Utilization of hip strategy will be reduced in low back pain patients.<sup>4</sup>

The use of lumbar corset in the treatment of discogenic low back pain could be a valuable rehabilitation tool. This brace

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exerts the necessary degree of compression in the lumbar region and achieves correction of sagittal plane spine balance to improve postural control of the lumbar spine.<sup>2</sup>

Evidences show that hip strategy is seen to be affected in quiet standing in patients with chronic low back pain. Lumbar corset is used in the treatment of low back pain. It is shown that lumbar corset is effective in scoliosis and osteoporosis.

To our knowledge very few studies are seen on the immediate effect of lumbar corset on balance in low back pain. Therefore the purpose of the study is to perform measurements of lumbar corset effect on postural balance.

**MATERIAL AND METHOD**

**Study Design**

**Type of study:** Comparative study.

**Duration of study:** 1 year.

**Place of study:** Metropolitan city

**Study Design**

**Sample size:** 45

**Sample population:** Chronic low back patients with 40 – 60 years

**Sampling:** Convenient sampling.

**Selection Criteria**

**Inclusion criteria**

Individuals with non-specific low back pain more than 6 months willing to participate between age group 40-60 years

**Exclusion criteria**

- Post-surgical, Post traumatic or Pathological low back pain
- Any acute cardiovascular conditions
- Any neurological defects
- Any vestibular dysfunction
- Use of drugs like sedatives or tranquillizers
- Individuals with visual impairment

**Material Used**

- Lumbar Corset
- Pen
- Paper
- Measuring tape

**Procedure**

Subjects were screened as per the inclusion criteria. Prior to study a written informed consent form was taken from each subject in the language best understood by them. Patients with chronic low back pain were taken with convenient sampling method. Balance was assessed using Functional Reach Test (FRT) with and without a lumbar corset. The data was collected, analysed and results were interpreted.

The patient was positioned close to the wall so that they may reach forward along the length of the yardstick. The patient was instructed to stand with feet shoulder distance apart then make a fist and raise the arm up so that its parallel to the floor. At this time the examiner takes an initial reading on the yard stick, usually spotting the knuckle of the third metacarpal. The patient was instructed to reach forward along the yardstick without moving the feet. Any reaching strategy is allowed but

the hand should remain in a fist. The therapist takes a reading on the yardstick of the farthest reach attained by the patient without taking a step.

Same procedure was repeated by making the patient wear a lumbar corset and values for the same was taken.

Distance reached in inches. The 3<sup>rd</sup> MCP joint is used as the marker.

Three readings of each with and without lumbar corset was taken and mean was interpreted.

**Normative Scores**

Age	Men (inches)	Women (inches)
20-40	16.7 (+/-1.9)	14.6 (+/-2.2)
41-69	14.9 (+/-2.2)	13.8 (+/-2.2)
70-87	13.2 (+/-1.6)	10.5 (+/-3.5)

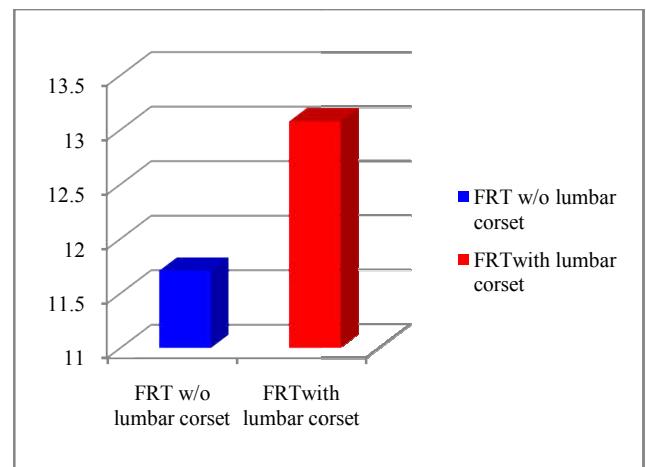
**Demographic Data**

<b>Sample size</b>	<b>45</b>
Age group	40-60 years
Mean age	50.44 Years
Standard deviation	9.47

**RESULTS**

The results of the study showed that out of 45 individuals, 39 showed immediate improvement in balance with the use of lumbar corset and the remaining 6 showed no improvement with the corset. (P <0.001) i.e. extremely significant.

**Graph of Immediate Effect of Lumbar Corset on Balance in Chronic Low Back Pain Patients**



	FRT w/o lumbar corset	FRT with lumbar corset	P value	Level of significance
Mean	11.71	13.080	<0.0001	Highly significant
S.D	2.048	2.161		
S.E.M	0.305	0.322		
N	45	45		

**Inference;** The above graph shows significant difference in Functional Reach Test (FRT) values with and without lumbar corset (p<0.0001).

**DISCUSSION**

The aim of the study was to assess the immediate effect of lumbar corset on balance in chronic low back patients between the age of 40-60 years. The sample consisted of 45 individuals, age averaging 50.44(±9.47) years. To assess balance of participants Functional reach test (FRT) was explained to subjects and accordingly readings were marked for each

subject. Reading were noted without the use of lumbar corset and then with the lumbar corset. Mean of both pre and post-corset values was taken and interpretations were made using paired T test.

Various studies have identified balance impairments in patients with chronic LBP, with many possible causes suggested. Recent evidence indicates that study participants with LBP have impaired trunk muscle control, which may compromise the control of trunk and hip movement during postural adjustments. As balance on a short base emphasizes the utilization of the hip strategy for balance control, we hypothesized that patients with LBP might have difficulties standing on short bases. Ankle strategy is more used in comparison with hip strategy.<sup>4</sup>

Studies report that patients with low back pain exhibit a decrease in endurance, decrease in flexibility, and limited range of motion and also that these symptoms affect balance ability compared with normal individuals. Lumbosacral orthoses for patients with low back pain can decrease low back pain and help to improve balance ability by stabilizing the lumbosacral area.<sup>2</sup>

Redford et al. reported that lumbosacral orthoses used a lot by patients with low back pain can mitigate pain by limiting movement of the trunk and decreasing the load on the waist by transmitting forces applied to intervertebral discs to soft tissue surrounding the abdomen<sup>6</sup>.

Therefore from the above data we can state that immediate usage of lumbar corsets help in improving the balance in chronic low back pain patients.

## CONCLUSION

Thus our study to determine an immediate effect of lumbar corset on balance in chronic low back pain patients concluded that there was a significant difference in balance of individuals post wearing a lumbar corset.

### Limitations

1. Small sample size
2. Obesity was not considered

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