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# To Compare the Effect of Lumbar Stabilization Exercise and Conservative Treatment in Lowback Pain for Healthcare Professionals

K. Kotteeswaran<sup>1</sup>, S. Sahiya Anjum<sup>2</sup>, M. Akshaya<sup>2</sup>, S. Santhana Lakshmi<sup>2</sup>

<sup>1</sup>Professor, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Sciences, Chennai, India.

<sup>2</sup>BPT Internee, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Sciences, Chennai, India.

## ABSTRACT

**Introduction:** Lumbar stabilization exercise provides a greater support to spine and helps in preventing low back pain. Lumbar stabilization exercise includes pelvic tilting, Knee to chest position, lumbar rotation stretch, transverse abdominis tuck, hip bridging exercises.

**Aim:** The aim of the study is to determine the effectiveness of lumbar stabilization exercises and conservative treatment in low back pain for health care professionals.

**Method:** 30 subjects were selected based on the inclusion and exclusion criteria. Group A Consist of 15 subjects were given lumbar stabilization exercise with interferential therapy. Group B Consists of 15 subjects were given conservative treatment with interferential therapy. The outcome factor used is NPRS (Numerical pain rating scale) and Modified Oswestry low back pain disability Questionnaire. The collected data was tabulated & analyzed using descriptive & inferential statistics.

**Result:** paired t-test revealed that the mean are statistically significant between pre-test and post test in lumbar stabilization group with  $p < 0.05$  and the unpaired t-test conducted between group A and B resulted that there was a significant difference between the groups with the p value of 0.0001.

**Conclusion:** This study concluded that lumbar stabilization exercises with interferential therapy (Group A) is more effective than conservative management with interferential therapy (Group B) in the management of low back pain among healthcare professionals.

**Key Words:** Low back pain, Lumbar stabilization exercises, Health care professionals, Interferential therapy, Oswestry low back pain disability Questionnaire, lumbar stability

## INTRODUCTION

Health care professionals are all people engaged in actions whose primary intent is to enhance health, they are the one who study, diagnose, prevent and treat human illness, injury and other physical and mental impairments. The types of hazards which are faced by healthcare professionals are physical hazard, chemical, biological, radiation, stress, stalking by patients and violence, they are at a high risk of musculoskeletal disorders due to patient handling.<sup>1</sup> Low back pain is one

of the most common work-related musculoskeletal disorders among health care professionals. Work-related low back pain (LBP) causes disability which affects their activities of daily living and work productivity. The main risk factors of LBP are bad postures, bending, twisting and frequent lifting,<sup>2</sup> awkward posture, repetitive work, manual handling of loads, poor ergonomic conditions and particular incorrect lifting factors are also causes a broad range of musculoskeletal disorders, particularly low back pain.<sup>3</sup> Physicians, dentists, nurses, physiotherapists, and other healthcare professionals

### Corresponding Author:

Dr. K. Kotteeswaran, Professor, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Sciences, Thandalam, Chennai; Email: [k.kotteeswaran@gmail.com](mailto:k.kotteeswaran@gmail.com)

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face repetitive trauma and incessant strains in their routine patient care activities which paving the way to chronic illness and musculoskeletal injuries.<sup>4</sup> The main biomechanical risk factor in work place is Awkward postures (bending, twisting, reaching overhead, kneeling, squatting, pinch grips) of health care professionals while performing physical task causes biomechanical stress (compressive stress) to the joints and surrounding soft tissues causing low back pain. The compressive stress is created on posterior elements due to abnormal exaggeration of lumbar curve which weakens the abdominal muscles and causes low back pain.<sup>5</sup> Various exercises such as lumbar stabilization exercise, motor control exercises, core strengthening exercises, lumbar flexion exercises, walking exercises, bracing exercises has been proposed to reduce the chronic low back pain. These Exercise can improve back extension strength, mobility, endurance, and functional disability.<sup>6</sup> Lumbar stabilization is an active form of exercise which is designed to strengthen the muscles to support the spine and help prevent lower back pain. In specific stabilization exercises lead to changes in motor programming of the automatic feed-forward recruitment of deep core muscles.

Pain and disability is decreased following application of lumbar stabilization exercises. It also helps in improving the neuromuscular control, quality of movements, co-ordination.<sup>7</sup> Transverse abdominis muscle which attached to the vertebra through thoracolumbar fascia helps in stiffening the spine by increasing intra – abdominal pressure.<sup>8</sup> This exercise can be performed by the isolated contraction of transverse abdominis and lumbar multifidus through an abdominal tuck in quadruped position, sitting, supine and standing positions. Progression of this exercises are by placing additional loads on spine through various upper extremities, lower extremities and trunk movement patterns. The goal is to recruiting the variety of trunk muscles.<sup>9</sup> The underlying concept of these exercise programs is the ability of the muscular system to help maintain a neutral position of the spine and to prevent excessive lumbar segment motion.<sup>10</sup> Studies shows the musculoskeletal disorders are some main cause for frequent sick leave, along with that psychological stress, exposure to different occupational hazards could also have an adverse effect on physical health and it will indirectly increase sick leave.<sup>11</sup>

The Oswestry Disability Index (ODI) is a quantitative outcome measure used for individuals with low back pain (LBP). The ODI is a self-administered questionnaire which contains 6 statements in 10 domains that are scored from 0-5. Scores are associated with degree of disability ranging from minimal to bedbound. The ODI is a valid, reliable, and responsive condition-specific assessment tool that has withstood the test of time and scrutiny. So far, it has been used mostly in chronic and severely disabled populations, but shows good indicators for the assessments of less severe

complaints. Interpretability of the ODI is good. The ODI is an acceptable tool to measure disability caused by LBP and it is easy to administer, score, objectifies patient's complaints and monitors effects of therapy.<sup>12</sup>

## MATERIALS AND MEDTHODS

The study was designed as Quasi experimental study. The study setting was physiotherapy outpatient department, Saveetha Medical College and Hospital and this study was approved by Institutional Scientific review board 007/01/2020. 30 subjects who were willing to participate were selected using convenient sampling technique, based on inclusion and exclusion criteria. The subjects included are health care professionals such as duty nurses, physiotherapists of both genders between the age group of 25-55years who have been suffering from chronic low back pain. In this study we excluded conditions like Spinal fracture, Spondylolisthesis, Spinal stenosis, TB spine and other recent Spinal surgeries.

The safety and simplicity of the procedure were explained to the patient and written consent was obtained from the subject in their known language. The pre-test values were obtained using Oswestry disability questionnaire. Oswestry disability questionnaire consists of 5 domains each question is scored on a scale of 0-5; with the first statement is 0 indicating the least amount of disability and the last statement is scored as 5 indicating most severe disability. The score of all questions summed then multiplied by 2 to obtain the disability index. The subjects has been categorised into moderate disability, severe disability and crippled by using Oswestry disability Questionnaire.

Subjects were categorised in two groups, Group A comprising of 15 subjects were treated with lumbar spine stabilization exercises includes pelvic tilt, Knee to chest position, lumbar rotation stretch, hip bridging with exercise ball. Group B comprising of 15 subjects were given conservative treatment like hamstring stretch, back extensor exercises, gluteal stretch, cat and camel position. Both the groups were treated with interferential therapy. The exercise were given for the period of 4 weeks. After the intervention the post-test evaluation was taken as the same in pre-test. The values were tabulated and statistically analysed.

## STATISTICAL ANALYSIS

The collected data were tabulated and analysed using descriptive and inferential statistics. Paired t-test is used to analyse significance between pre and post test values. and unpaired t-test was used to analyse significance between two groups. p value <0.05 was considered as statistically significant.

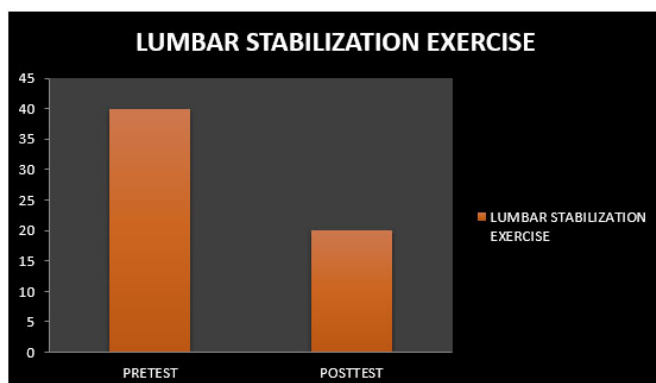
## RESULT

From the statistical analysis made with the quantitative data, paired t-test revealed that the mean are statistically significant between pre-test and post-test in lumbar stabilization group with  $p < 0.05$  and the unpaired t-test conducted between group A and B resulted that there was a significant difference between the groups with the p-value of 0.0001. Thus lumbar stabilization exercises have a significant role in reducing low back pain in health care professionals.

**Table 1: Pre and Post test comparison of Lumbar stabilization exercise.**

	Mean	SD	T value	P value
Pre test values of group A	54.13	10.57	12.25	<0.0001
Post test values of group A	26.13	3.94		

The pre test mean value of ODI is 54.13 (SD: 10.57) and post test mean value is 26.13 (SD: 3.94). This interprets that functioning of low back is gradually increasing with the P value 0.0001, which is considered to be statistically significant.

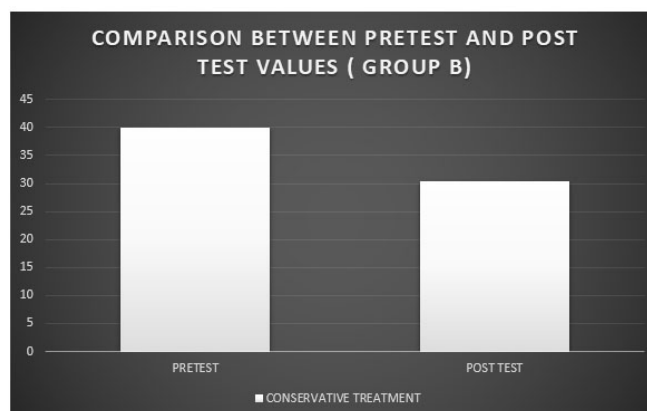


**Figure 1:** represents the mean comparison of lumbar stabilization group with the pre test mean value of ODI is 54.13 and post test mean value is 26.13

**Table 2: Pre and Post test comparison of conservative therapy group.**

	Mean	SD	T value	P value
Pre test	54.13	10.57	11.39	<0.0001
Post test	50.66	6.28		

The pre test mean value of ODI is 54.13 (SD: 10.57) and post test mean value is 50.66 (SD: 6.28). This interprets that functioning of low back is gradually increasing with the P value 0.0001, which is considered to be statistically significant.



**Figure 2:** represents the mean comparison of conservative therapy group with the pre test mean value of ODI is 54.13 and post test mean value is 50.66

## DISCUSSION

This study was conducted to investigate the effect of lumbar stabilization exercises and conservative treatment in low back pain for health care professionals. This study is based on 4 weeks program of lumbar stabilization exercise with interferential therapy given to 20 low back pain patients and also conservative treatment with interferential therapy given to another 20 low back pain patients. Low back pain is a common problem faced by majority of the healthcare professionals. This is due to their exertion associated with patient handling tasks. We have included patients meeting the criteria such as low back pain that is been caused by repetitive trauma and incessant strains faced by the health care professionals in their daily routine, and the outcome measure used is Numerical pain rating scale and Modified oswestry disability index.

LBP is defined as a common type of pain, stiffness and muscle tension localised below the coastal margin and above the inferior gluteal folds with or without leg pain. Work related MSDs are referred to as non-traumatic inflammatory or degenerative disorders of the musculoskeletal structures such as cervical spine, lower back region, upper and lower extremities. This causes disability which affects their activities of daily living and work productivity. The main risk factors of LBP are bad postures, bending, twisting and frequent lifting,<sup>2</sup> awkward posture, repetitive work, manual handling of loads, poor ergonomic conditions and particular incorrect lifting factors are also causing a broad range of musculoskeletal disorders, particularly low back pain. There is a significant relationship found between the health care professionals and the low back pain, which further causes certain adverse among which sick absenteeism is the major. Sick absenteeism can be defined as the absence from work or lack of presence during work. It represents their health status, affects the work place utility, efficiency and quality of patient

care. There is a significant relationship between work schedule and health safety is a complex one and it is influenced by characteristics of work schedule (time of shift, day off, shift length), as well as characteristics of job, worker, and the worker environment. These work issues exerts adverse effects by disturbing their circadian rhythm, sleep, family and social life. Healthcare professionals are the one who are experiencing the most risk of injury during their patient transferring, repositioning and lifting devices. These physical tasks cause biomechanical stress over the lumbar region and its surrounding soft tissues.

Lumbar Stabilization exercise focus on the re-education of a precise co-contraction pattern of local muscles of the lumbar spine. Hence Pain and disability are decreased following application of lumbar stabilization exercises. It also helps in improving the neuromuscular control, quality of movements, co-ordination.<sup>7</sup> Lumbar stabilisation primarily aimed at improving neuromuscular control, strength, endurance of the muscles, which are useful for maintenance of dynamic spinal and trunk stability. Some studies proves that lumbar stabilisation exercise were more effective in strengthening lumbar extensors group of muscles at small lumbar flexion angle and for improving the functional disability.

## CONCLUSION

This study demonstrated that the lumbar stabilisation exercise for health care professionals has a significant improvement in reduction of low back pain on terms of neuromuscular control, strength, endurance, co-ordination and quality of movement compared to conventional exercises. It is recommended that future studies should be conducted to study the efficacy of lumbar stabilisation exercise in detail among large and diverse population with long term follow-up.

## CONFLICT OF INTEREST

All authors of the study declare no conflict of interest.

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## AUTHORS CONTRIBUTION:

AUTHORS CONTRIBUTION	KK	SA	MA	SL
Research concept and design	✓	✓	✓	✓
Collection of samples	✓	✓	✓	✓
Data analysis and interpretation	✓	✓	✓	✓
Writing the article	✓	✓	✓	✓
Critical revision of the article	✓	✓	✓	✓
Final approval of the article	✓	✓	✓	✓

## REFERENCES

- Mohanty A, Kabi A, Mohanty AP. Health problems in healthcare workers: A review. *J Family Med Prim Care*.2019;8(8):2568–2572.
- Pakkir Mohamed SH, Al Amer HS. Prevalence of Work-Related Low Back Pain among Health Care Professionals in Tabuk, Saudi Arabia. *Majmaah J Heal Sci*.2019;7(1):52-65.
- Mehrdad R, Shams-Hosseini NS, Aghdaei S, Yousefian M. Prevalence of Low Back Pain in Health Care Workers and Comparison with Other Occupational Categories in Iran: A Systematic Review. *Iran J Med Sci*.2016;41(6):467-478.
- Koyuncu N, Karcioglu O. Musculoskeletal complaints in healthcare personnel in hospital An interdepartmental, cross-sectional comparison. *Medicine*.2018;97(40):1-6.
- Trinkoff AM, Lipscomb JA, Geiger-Brown J, Storr CL, Brady BA. Perceived physical demands and reported musculoskeletal problems in registered nurses. *Am J Prev Med*. 2003;24(3):270-275.
- Suh JH, Kim H, Jung GP, Ryu JS. The effect of lumbar stabilization and walking exercises on chronic low back pain A randomized controlled trial. *Medicine*.2019; 98(26):1-9.
- Hosseini M, Akbari M, Behtash H, Amiri M, Sarrafzadeh J. The Effects of Stabilization and Mckenzie Exercises on Transverse Abdominis and Multifidus Muscle Thickness, Pain, and Disability: A Randomized Controlled Trial in Non-Specific Chronic Low Back Pain. *J. Phys. Ther.Sci*.2013; 25(12) :1541-1545.
- Barr KP, Griggs M, Cadby T. Lumbar stabilization: Core concepts and current literature, part 1. *Am J Phys Med Rehabil*.2005;84:473–480.
- Rabin A, Shahua A, Pizem K, Dickstein R, Dar G. A Clinical Prediction Rule to Identify Patients With Low Back Pain Who Are Likely to Experience Short-Term Success Following Lumbar Stabilization Exercises: A Randomized Controlled Validation Study. *J Orthop Sports Phys Ther*.2014;44(1):6-18.
- .Abass AO, Alli AR, Olagbegi OM, Chirstie CJ, Bolarinde SO. Effects of an eight-week lumbar stabilization exercise programme on selected variables of patients with chronic low back pain. *Bangladesh J Med Sci*.2020;19(3):467-474.
- Mollazadeh M, Saraei M, Mehrdad R, , Izadi N. Sickness absenteeism of Healthcare Workers in a Teaching Hospital. *Hospital Practices and Research*.2018;3(1):6-10
- Vianin M. Psychometric properties and clinical usefulness of the Oswestry Disability Index. *J Chiropr Med*.2008;7(4):161–163.