International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

The Effectiveness of Lumbar Strengthening Exercises with Lumbar Supporting Mechanical Low Back Pain among Office Workers

C. Nageswari [1], D. Alice [2], D. S. Lakshmipriya [3]

[1] Professor cum Principal, Shri Indra Ganesan Institute of Medical Science College of Physiotherapy Tamilnadu, India
[2] Assistant Professor, Shri Indra Ganesan Institute of Medical Science College of Physiotherapy Tamilnadu, India
[3]Physiotherapy Student, Shri Indra Ganesan Institute of Medical Science College of Physiotherapy Tamilnadu, India

ABSTRACT

Mechanical low back pain is primarily managed in general practice and commonly underestimated. This study presents the evaluation and the physiotherapy management of mechanical low back pain according to current physiotherapy studies guideline [1]. Today, the office workers life style has become omnipresent; as an increasing number of individuals spend a lot of time in sitting posture [3]. Mechanical low back pain occurs due to long term poor posture coupled with desk bound habits that put back under the severe mechanical stress. It remains the second most common symptom related problem among the population [2]. There are multiple treatment modalities for mechanical low back pain ,but strong evidence of benefit is often lacking [4].Function becomes impaired, activities of daily living are changed to accommodate back pain, and quality of life suffers [5]. Mechanical Low back pain due to cumulative trauma tends to occur more commonly in the workplace [6]. Lumbar segmental stability is an important biomechanical component that influences symptoms amongst patients with Mechanical low back pain [7]. Since mechanical low back pain is the third leading cause of self-perceived disability due to various diseases and indicates a major economic burden to society. Specially, office workers have recently become focus of attention in this field us they spend 95% of their work in a seated position. This study, gives the importance of the role lumbar strengthening exercises with lumbar support in mechanical low back pain.

Keywords: Mechanical low back pain, Office workers, Lumbar strengthening exercises, Lumbar support.

1. INTRODUCTION

Mechanical Low Back Pain account for 80 % of the low back aches and are due to mechanical causes like back muscle strains, ligaments sprain and disk problems, due to sudden unfamiliar activities and improper postures. Today, the office workers life style has become omnipresent, as an increasing number of individuals spend widen time in a seated posture at work as well as during free time simultaneously, the prevalence of Mechanical Low Back Pain has increased among office worker in general. Mechanical Low back pain is a collective process from long term poor posture coupled with desk bound habits that put the back under severe mechanical stress. And it remains the second most common symptom related problem among the population. In India, a study was preside over and come to an end that the frequency of Mechanical low back pain is the most commonly exiting diseases in the third decades. Specially, office employees have recently become the focus of attention in this field as they spend up to 95% of their work time in a seated position. Since Mechanical Low back Pain is the third leading cause of self – perceived disability due to various diseases and indicates a major economic burden to society. Some of the causes of the mechanical low back pain include physical activities, muscles weakness in lumbar region, improper working environment and trauma. In addition, some conditions such as long periods of sedentary life style, abnormal, excessive tension of muscle, and abdominal obesity can contribute abnormal contracture, which leads to Mechanical Low Back Pain. Furthermore, increased kyphosis reduces the mobility of trunk, and as a result, abnormal movement of the lumbar vertebra appear as a compensation movement. This abnormal movement takes the instability of the facet joints more severe, and the mechanical low back pain can easily occur. The Mechanical Low Back Pain can be managed by Strengthening Exercise for the back muscles [Lumbar region]. In this study I would like to present the importance of the role of Strengthening Exercise with Lumbar Support in the Mechanical Low Back Pain.

In the earlier strengthening exercises were performed and proved to be effective for mechanical low back pain. The lumbar strengthening exercises was done with lumbar support for patients with mechanical low back pain. Hence need for the study arises and the purpose of the study is to find the effect of lumbar strengthening exercises with lumbar support among office workers with mechanical low back pain.

1.1 AIM OF THE STUDY

The purpose of this study is to ascertain the effect of lumbar strengthening exercises with lumbar support in Mechanical Low Back Pain among office workers.

1.2 OBJECTIVE OF THE STUDY

Pain among office workers. The lumbar muscles will be strengthened by performing strengthening exercises in various positions with lumbar support to reduce the Mechanical Low Back

1.3 MATERIALS AND METHODOLOGY

MATERIALS USED:

- Treatment Couch
- Pillow
- Goniometer
- Assessment Chart
- Exercise Chart
- Orthotics [LUMBO-SCARAL BELT]

METHODOLOGY

Study design

This study is an comparative study with pre and post test evaluation**.**

Sample collection

- 5 Subjects with Mechanical Low Back Pain based on the history were selected by the convenient sample.

1.4 Inclusion Criteria

- Subjects only with Mechanical Low Back Pain.
- Both men and women are eligible for the study.
- Age group between 45-50 years.
- Subjects who is willing for the study.
- Centralized pain.
- Subjects who had a long time sitting posture and heavy lifting jobs.

1.5 Exclusion Criteria

- Any systemic diseases.
- Persons with Rheumatoid Arthritis.
- Recent fractures in the pain.
- Spinal infection.
- Congenital deformity.
- Ankylosing Spondylitis.
- Radiating Pain.
- Cauda Equina Syndrome.
- Current use of steroids or any drug for back pain.

1.6 Study period:

Three months

Study setting

The study was conducted in Shri Indra Ganesan Institute of Medical Science, College Of Physiotherapy, Out Patient Department, Trichy and Frontline Hospital, Trichy.

Study method

Five patients treated with lumbar muscles strengthening exercises with support in various position.

1.7 OUTCOME MEASURES

With the help of the measurement tools like assessment, Mechanical Low Back Pain is measured by Numerical Pain Rating Scale.

1.8 STATISTICAL ANALYSIS

The collected data will be tabulated and analyzed using descriptive & inferential statistics. To all the parameters mean and standard deviation (SD) will be used. Paired t-test will be used to analyze significant changes between pre-test & post-test measurements.

1.9 HYPOTHESIS OF THE STUDY

NULL HYPOTHESIS: The Null hypothesis states that there is no significant improvement on strengthening the lumbar muscles with lumbar support among office workers with Mechanical Low Back Pain.

ALTERNATE HYPOTHESIS: The Alternative hypothesis states that there is a significant improvement on strengthening the lumbar muscles with lumbar support among office workers with Mechanical Low Back Pain.

2.0 PROCEDURE

- The Total number of 5 subjects who fulfilled the selection criteria were undergone the strengthening exercises procedure.
- After a brief demonstration about the lumbar muscle strengthening training for a period of 12 weeks. The post test was conducted and the results were recorded and analyzed to compare the pre-test and post test result.

2.1 PARAMETERS :

NUMERICAL PAIN RATING SCALE

It is a unidimensional measure of pain intensity in adults, including in adults, including those with chronic pain.

GONIOMETER

A Goniometer is aninstrumentthat measures that available range of motion at a joint. The art and science of measuring the joint ranges in each plane of the joint are called goniometry. To measure the range of motion physical therapists most commonly use a goniometer. If a patient is suffering from decreased range of motion in a particular joint, the therapist can use a goniometer to assess what a range of motion is at the initial assessment, and then make sure the intervention is working by using the goniometer in subsequent.

2.2 TECHNIQUES USED

Strengthening exercises have been used successfully to treat patient with mechanical low back pain. Evidence suggest that the lack of muscle strength can itself contribute to low back pain even in the absence of degeneration.

STRENGTHENING EXERCISES

Cat and Camel Exercises

Get down on your hands and knees. Let your stomach sag, allowing your back to curve downward. Hold this position for 5 seconds. Do 3 sets of 10.

Pelvic Tilt

Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push lower back into the floor. Hold this position for 5 seconds, the relax. Do 3 sets for 10.

Quadruped Arm \ Leg Raise Exercises

Get down on your hands and knees. Tighten your abdominal muscles to stiffen your spine. While keeping your abdominals tight, raise one arm and the opposite leg away from you. Hold this position for 5 seconds, Lower your arm and leg slowly and on alternate sides. Do this 10 times on each side.

Double Knee to Chest

Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Pull both knees up to your chest. Hold for 5 seconds and repeat 10 to 20 min.

LUMBOSACRAL BELT

It encompass the lumbar and sacral region of the lower spine. It is made of fabric [Cloth garment] that encompasses the torso with adjustable front, side or back Velcro [hooks] fasteners allow user to control the degree of tension for proper support and comfort. The Anterior borders of LS Corset are superior to symphysis pubis and inferior to the Xiphoid process. LS Corset are custom fitted to each client and offer interabdominal support which helps to relieve lumbar sacral back pain , mechanical low back pain and other general lower back aliments .

Functions: They support the lower spine; reduce pressure on the lumbar sacral region by increasing intra – abdominal pressure also acting as a reminder to the patient to maintain correct posture [Restrict motion]. This orthotics is very popular in the treatment of mechanical lower back pain.

TABLE – 1

Table 1 represent the mean values, mean difference , Standard deviation and paired 't' value between pre and post-test value of Numerical pain rating scale (NPRS)

S. No	NRPS	Mean	Mean Difference	Standard Deviation	T value
1	**Pre test**	8	3.6	1.55	5.03
2	**Post test**	4.4			

It explains the paired't' test value of pre and post-test 5.03 to 0.05 level of significance. The pre-test mean is 8, the post-test mean is 4.4, and the mean difference is 3.6, which shows that there is recovery of selected samples is response to intervention.

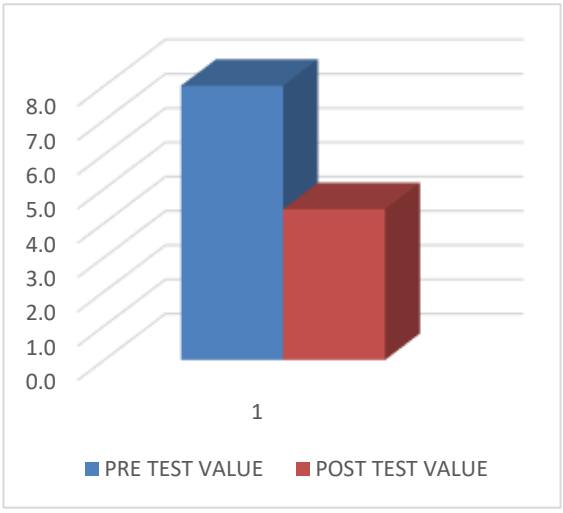

Figure – 1 : Graphical Representation of Mean for pre and post-test value by Numerical pain rating scale

3. DISCUSSION

Mechanical low back pain is one of the major public health issues. In attempt to prevent the pain and most importantly to prevent transition towards the chronic stage, various physiotherapeutic approaches have been emerged. Indeed is one of the most common reasons for medical consultation and second most common reason for absenteeism. Due to the high economic impact by the disease on the society, cost efficient treatment approach is one of the most essential wanting. Exercise plays an important in the management of mechanical low back pain. In the study of Sudhir Ganesan el at stated that the prevalence and risk factors of low back pain in India are among adults between the age group of 30-45 years. Mechanical low back pain isa problem tackled by most of the office worker. The aim of the study was to find the effect of lumbar muscles strengthening training with lumbar support to improve the patients with mechanical low back pain. A total number of 5 patients who had mechanical low back pain were treated with lumbar muscle strengthening exercise. After 12 weeks a post test was conducted by numerical pain rating scale and result was recorded and further statistical analysis.

4. LIMITATIONS

- The study duration was short only 12 weeks and might differ in longer run.
- Sample sizes taken for the study is small.

- Limited parameter of outcome measures was used which might bias the result.
- There are some limitations with respect to data source and availability, which should be taken into consideration when interpreting the results.

5. CONCLUSION

Based on the results, the alternate hypothesis is proved and it is concluded that the Lumbar muscle strengthening exercises with lumbar support has increased the Range Of Motion of the patient with Mechanical Low Back Pain and improving the functional ability. The effects of lumbar stabilization exercises performed on a stable or unstable surface on lumbar pain [8]. The Study can be done on large sample. Similar studies can be done on longer duration. The future studies samples can be selected from other age groups. Gender based studies can also be done. Future studies can be carried in disc prolapse, radiating pain and Inflammatory Low back pain. Similar study can be done with McKenzie Exercises.

Reference

1. Hani Almoallim1,2,3*, Samar Alwafi1,2, Khaled Albazli1,2, Manal Alotaibi1,2, Tuqa Bazuhair1,2 A Simple Approach of Low Back Pain International Journal of Clinical Medicine, 2014, 5, 1087-1098 Published Online September 2014 in SciRes. http://www.scirp.org/journal/ijcm http://dx.doi.org/10.4236/ijcm.2014.517139.
2. Anit-aqulina-daisy, S.Sivakumar, Dr.Edmund md couto ,To Compare The Effect Of Global Stability Training With Sitfit And Swissball In Improving The Core Stability Among The Patients With Mechanical Low Back Pain. 2019.
3. Anitha Arul1,Senthilkumar Natarajan 2 April 2021 . Turk FizyoterapiveRehabilitasyonDergisi/ Turkish journal of physiotherapy and Rehabilitation(3292):1343
4. Joshua Scott Will, Do, David C. Bury, Do, And John A. Miller, DPT Am Fam Physician. Mechanical Low Back Pain , October 1, 2018;98(7):421-428.
5. Vincent E. Casiano et al.The randomized study on Back pain – 2022,statpearls publishing LLC.
6. Everett C Hills, MD,Mechanical low back pain , journal of American academy of physical medicine and rehabilitation , MEDSCAPE. Feb 02, 2022
7. Senthil P Kumar N Am J Med Sci. 2011 Oct; 3(10): 456–461.doi: 10.4297/najms.2011.3456
8. Kang, Tae-Wooa, Lee, Ji-hyunb, Park, Dong-Hwanb, Cynn, Heon-Seockb; *Journal: Work, vol. 60, no. 3, pp. 445-454, 2018.
9. Carleen Lindsey PT, MScAH, GCS, in Geriatric Physical Therapy (Third Edition), 2012.
10. Ana Vanessa Bataller-Cervero,1 Juan Rabal-Pelay,1 Luis Enrique Roche-Seruendo,1 Belén Lacárcel-Tejero,2 Andrés Alcázar-Crevillén,2 Jose Antonio Villalba-Ruete,3 and Cristina Cimarras-Otal1,*Ind Health. Effectiveness of lumbar supports in low back functionality and disability in assembly-line workers 2019 Sep; 57(5): 588–595.Published online 2019 Jan 16. doi: 10.2486/indhealth.2018-0179.
11. J. Funct. Morphol. Kinesiol. 2019, 4(3), 43; https://doi.org/10.3390/jfmk4030043Received: 16 May 2019 / Revised: 27 June 2019 / Accepted: 3 July 2019 / Published: 5 July 2019.
12. Amir HoushangMehrparvar, 1 Mohammad Heydari, 2 SeyyedJalilMirmohammadi, 3 MehrdadMostaghaci, 4 Mohammad Hossein Davari, 5 and Mahmoud Taheri 6 Ergonomic Intervention workplace exercises and musculoskeletal complaints: a comparative study. Med J Islam Repub Iran. 2014; 28: 69.Published online 2014 Jul 16.
13. Rocío Fortún-Rabadán,1 Carolina Jiménez-Sánchez,1,2 Olatz Flores-Yaben,1 and Pablo Bellosta-López1 J Educ Health Promot. 2021; 10: 75. Work Place Physiotherapy for musculoskeletal pain in office workers a pilot study, Published online 2021 Feb 27. doi: 10.4103/jehp.jehp_888_20.
14. Rob Dickerman, DO, PhD Specific Low Back Pain Exercises, Published ;2005, spine health.
15. Nor Azizah,IshakZarina,Zahari ,UniversitiTeknologi MARAMaria Justine, Effectiveness of strengthening exercises for the elderly with low back pain to improve symptoms and functions: A systemic Review, volume 2016 |Article ID 3230427