Effectiveness of a Dynamic Ergonomic Chair in Individuals with Postural Dysfunction

Vaishnavi J Chavan[1], S. Anand[2]

[1]Internee, Faculty of Physiotherapy, KIMS 'Deemed to Be' University, Karad, Maharashtra, India, [2]HOD and Professor, Department of Community Health Sciences, Faculty of Physiotherapy, KIMS 'Deemed To Be' University, Karad, Maharashtra, India

Abstract

Objectives: Low back pain in postnatal women is a major issue. So, lumbar curvature is a key feature to maintain core strength for which it has to be assessed. The individual variations in spinal curvature and lordotic pattern signifies the bio mechanics of the spine and it responds according to the load / activities. To find out the pre-test measures of flexibility, functional capacity and discomfort level related to lumbar spine in the subjects with postural dysfunctions. To find out the post-test flexibility, functional capacity and discomfort level in the subjects with postural dysfunctions. To analyze the difference between the pre-test and post-test values. People should also have awareness about the posture maintenance. So, early assessment is necessary. Also secondary factors like the type of shoes wear, Occupation and Lifestyle can influence the spinal curvatures which can be dealt with easier with the outcome of the research.

Methodology: In this experimental study, 29 people with age group of 25 to 60 years who have chronic low back pain. Their lumbar spine flexibility, functional capacity, and discomfort level was measured pre-test and post-test. Results were obtained and compared.

Result: The average mean value of lumbar spine flexibility pre-test measured with schober test was 1.81 while post-test was 2.08. Average mean value of VAS for lumbar spine was 6.06 while post-test was 3.24. Average mean value for pre-test functional capacity measured with 6 min walk test was647.58 while post-test was 665.17.

Conclusion: On comparing summary score of lumbar spine flexibility, VAS, and functional capacity, the differences showed were 0.27 cms, 2.82, 17.59 metres respectively.

So, we can conclude that there was a signicant difference in the improvement of lumbar spine flexibility, functional capacity and also decrease in pain after the treatment.

Key Words: *Lumbar spine flexibility, VAS, functional capacity, schober test, 6 minute walk test, low back pain, postural dysfunction.*

Introduction

Low back pain is a leading cause of disability. It occurs in similar proportions in all cultures, interferes with quality of life and work performance, and is the most common reason for medical consultations. Few cases of back pain are due to specific causes; most cases are non-specific. Acute back pain is the most common presentation and is usually self-limiting, lasting less than three months regardless of treatment.[1]

Chronic back pain is a more difficult problem, which often has strong psychological overlay: work dissatisfaction, boredom, and a generous compensation system contribute to it. Among the diagnoses offered for chronic pain is fibromyalgia, an urban condition (the diagnosis is not made in rural settings) that does not differ materially from other instances of widespread chronic pain[2,3]. Although disc protrusions detected on X-ray are often blamed, they rarely are responsible for the pain, and surgery is seldom successful at alleviating it. No single treatment is superior to others; patients prefer

manipulative therapy, but studies have not demonstrated that it has any superiority over others.[4]

Some activities- such as jogging and running on cement roads rather than cinder tracks, heavy lifting, and prolonged sitting (especially in cars, trucks, and poorly designed chairs) can provoke back pain. Nevertheless, strong psychological factors do play a role.[5]

The following measures to be included in all studies to be reported (but not necessarily for consultations by individual patients):

• Appropriate history and physical examination-functional capacity.

• Modified Schober test of spinal mobility

• Measurement of pain on a visual analogue scale.[6,7]

Bed rest, supportive corsets, and braces, which used to be prescribed almost routinely, are no longer advocated for back pain, as they are thought to prevent the muscles from providing the necessary structural support. "Back schools"- in which posture, exercises, and other training for the back are taught- have limited value, especially for chronic pain, but they do have a potential role in education.[8,9]

Two of the most common causes of lower back pain in older adults include osteoarthritis and spinal stenosis. Degeneration of joints in the lumbar spine is a common cause of back pain in older adults.[10,11]

The lumbar spine supports the upper body and transmits the weight of the trunk with upper body to the pelvis and lower limbs. Lumbar spine consists of 5 vertebrae. The normal resting position of the lumbar spine is in S shaped and is midway between flexion and extension. Lumbar spine plays an important role for posture and stability providing the strength needed for stability especially utilized in static and dynamic postures[12].

Lumbar lordosis: The anterior concavity in the curvature of the lumbar spine as viewed from the side.

Or

An abnormal increase in lumbar curvature[12].

Methodology

An approval for the study was obtained from the Protocol committee and the Institutional Ethical Committee of KIMSDU. Individuals were approached and those fulfilling the inclusion criteria were selected. Total 29 individuals were selected. The procedure was explained and written informed consent was taken from those willing to participate.

Demographic information of the subjects was taken. The individuals were explained about the purpose of the study. Also, they were informed about the procedure. Each of them was assessed for the lumbar spine flexibility, VAS, functional capacity.[12,13]

In this experimental study, 29 women with age group of 25 to 60 years who have chronic low back pain. Results were obtained and compared.

Data was documented and statistical analysis was done

Data Presentation, Analysis And Interpretation:

1. Comparison of Pre-Test And Post-Test In Lumbar Spine Flexibility With Schober Test:

TABLE NO 1- COMPARISON OF PRE-TEST AND POST-TEST IN LUMBAR SPINE FLEXIBILITY WITH SCHOBER TEST.

LUMBAR SPINE FLEXIBILITY (MEAN) PRE-TEST	LUMBAR SPINE FLEXIBILITY (MEAN) POST-TEST
1.81	2.08

2. COMPARISON OF PRE-TEST AND POST-TEST IN FUNCTIONAL CAPACITY WITH 6 MIN WALK TEST:

TABLE NO 2- COMPARISON OF PRE-TEST AND POST-TEST IN FUNCTIONAL CAPACITY WITH 6MWT.

6MWT Distance (MEAN) PRE-TEST	6MWT Distance (MEAN) POST-TEST
647.58	665.17

3. COMPARISON OF PRE-TEST AND POST-TEST IN VAS:

TABLE NO 3- COMPARISON OF PRE-TEST AND POST-TEST IN VAS:

VAS (MEAN) PRE-TEST	VAS (MEAN) POST-TEST
6.06	3.24

Interpretation:

From the above data, it is clear that there is significant difference between pre-test and post-test values with a positive result that is improvement in the condition of subjects.

Significant difference

1. Differences In The Pre-Test And Post-Test Values:

TABLE NO. 4: DIFFERENCES IN THE PRE-TEST AND POST-TEST VALUES:

	PRE-TEST	POST-TEST
Schober test (in cms)	1.81	2.08
6MWT (in m)	647.58	665.17
VAS	6.06	3.24

Result

The average mean value of lumbar spine flexibility pre-test measured with schober test was 1.81 while post-test was 2.08. Average mean value of VAS for lumbar spine was 6.06 while post-test was 3.24. Average mean value for pre-test functional capacity measured with 6 min walk test was647.58 while post-test was 665.17.

Conclusion

After analyzing the data, it was found that the mean value of VAS is 6.06 Pretest and 3.24 Posttest.

Pretest schober test value (in cms) was 1.81 while posttest it was 2.08.

Pretest 6MWT (in m) value was 647.58 while posttest it was 665.17.

On comparing summary score of

1. VAS, significant difference of 2.82 was noted.

2. Schober test, significant difference of 0.27 cms was noted.

3. 6MWT, significant difference of 17.59 metres was noted.

Thus concluding that there is an improvement in the functional capacity, flexibility, and VAS of an individual in the post test results.

Conflicts of Interest: There were no conflicts of interest in this study

Ethical Clearance: Ethical clearance was taken from institutional committee of Krishna institute of medical sciences.

Funding: Self

References

1. Levangie P, Norkin C, Lewek M. Joint structure & function.
2. Dorland W. Dorland's pocket medical dictionary.
3. Hay O, Dar G, Abbas J, Stein D, May H, Masharawi Y et al. The Lumbar Lordosis in Males and Females, Revisited. PLOS ONE. 2015;10(8):e0133685.
4. Kisner C, Colby L, Borstad J. Therapeutic exercise.
5. Ehrlich GE. Back pain. The Journal of Rheumatology Supplement.2003 Aug1;67:26-31
6. Shaw W, Howkins J, Bourne G. Shaw's Textbook of gynaecology. Edinburgh [u.a.]: Churchill [u.a.]; 1971.
7. Lin RM, Jou IM, Yu CY. Lumbar lordosis: normal adults. Journal of the Formosan Medical Association= Taiwan yi zhi. 1992 mar;91(3):329-33.
8. Van Niekerk SM, Louw QA, Hillier S. The effectiveness of a chair invention in the workplace to reduce musculoskeletal symptoms. A systematic review. BMC musculoskeletal disorders. 2012 Dec;13(1):145
9. Mogren IM, Pohjanen AI. Low back pain and pelvic pain during pregnancy: prevalence and risk factors. Spine 2005 Apr 15;30(8):983-91.
10. Westgaard RH, Winkel J. Ergonomic intervention research for improved musculoskeletal health: A critical review. International journal of industrial ergonomics. 1997 Dec 1;20(6):463-500.
11. de Oliveira TS, Candotti CT, La Torre M, Pelinson PP, Furlanetto TS, Kutchak FM, Loss JF. Validity and reproducibility of the measurements obtained using the flexicurve instrument to evaluate the angles of thoracic and lumbar curvatures of the spine in sagittal plane. Rehabilitation Research and Practice. 2012;2012.
12. Derry S, Conaghan P, Da Silva JA, Wiffen PJ, Moore RA. Topical NSAIDs for chronic musculoskeletal pain in adults. Cochrane Database of Systematic Reviews. 2016(4).