



“Effect of ergonomics advice on the Teachers with mechanical low back pain: A pilot study”

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ABSTRACT: This study is done at the Parul university campus. There is totally 30 participants were taken. There were two outcome measure were taken and ODI and NPRS. written consent is taken from the participants. total study duration is 2 weeks. Intervention is given in the form of ergonomics advice. out measure checked after 2 weeks only. the study concluded that the ergonomics advice are effective to improve the participants QOL and helps to reduce the pain.

Key words: low back pain, ODI, NPRS

INTRODUCTION

Mechanical low back pain arises intrinsically from the spine, intervertebral disks, or surrounding soft tissues.^[1]

This includes lumbosacral muscle strain, disk herniation, lumbar spondylosis, spondylolisthesis, spondylolysis, vertebral compression fractures, and acute or chronic traumatic injury.1 Repetitive trauma and overuse are common causes of chronic mechanical low back pain, which is often secondary to workplace injury. Most patients who experience activity-limiting low back pain go on to have recurrent episodes.^[1]

The history and physical examination, with appropriate use of imaging, can point toward a specific etiology. However, the complexity and biomechanics of the spine make it difficult to identify a specific anatomic lesion, with a precise diagnosis made in only 20% of cases.

The history should include an assessment of pain location, severity, timing, aggravating/relieving factors, and radiation. Body mass index, physical activity, and occupational hazards should be used to assess risk of mechanical low back pain. Patients with psychosocial deficits or disabilities are more likely to develop chronic back pain and are more likely to be disabled by their symptoms.1 Physical examination should include evaluation of strength, sensation, and reflexes of the lower extremities. Inspection, palpation, and range-of-motion testing of the lumbosacral musculature are helpful for identifying point tenderness, restriction, and spasm.^[1]

The diagnosis of mechanical low back pain should be made when systemic disease and referred pain have been ruled out, and no red flags have been identified.

Physical therapists play an integral role in the diagnosis and treatment of low back pain; variable evidence exists for specific physical modalities. Manipulation and mobilization are no more effective than inert interventions for acute low back pain. However, a systematic review and meta-analysis concluded that osteopathic manipulative treatment is effective in reducing acute and chronic mechanical low back pain. There is strong evidence that spinal stabilization exercises have no long term advantages over other exercises. Exercise therapy is as effective as other therapies for the treatment of acute low back pain, and is slightly effective at reducing pain and improving function in chronic low back pain. However, early guideline-directed physical therapy has substantial reductions in use of health care and overall costs.^[1]

The physical factors that contribute to the development of MSDs among teachers are physical exertion and remaining in the same and sometimes awkward positions for most of the workday (sitting or standing) repetitive procedures, head down positions, frequent lifting of heavy loads, and many hours working with the hands raised.^[2,3] These physical factors have been strongly associated with both neck and shoulder pain. They also have the biomechanical bases to be possible risk factors for MSDs. In addition, other factors such as prolonged standing, poor sitting posture and activities such as carrying papers and books back and forth, moving equipment walking around both in and outside of the building might have an impact on the incidence of MSDs.^[2]

Teachers are the occupation that require standing for longer duration and often associated with increased risk of body's pain and discomfort throughout school hours. The Oxford Dictionary^[4,5] described 'standing' as being upright, hold up by one's feet, while 'prolonged' is sustaining same posture for a lengthy time than normal. 'Prolonged standing' has been defined with worker needs to sustain standing position and spending more than 50% of total working hours during a full work shift in the standing position.^[4,6]

A 2014 study documented a 55% prevalence of lower back pain among teachers, with 67.1% reporting minimal disability.^[7,8] Erick and Smith^[9,10] critically analysed the literature and report on the possible associated risk and protective factors among teachers. this study shows that^[9,11] there is 18.5% study population has low back pain.

Gendy and Korish^[9,12] stated that teaching experience and number of class per day were not related to back, upper limb disorders but were related to lower limbs disorders. Mohseni Bandpei et al.'s study^[13] also showed that period of employment has been one of the risk factors associated with low back pain, which is the greater risk of low back pain the longer the years of period teaching. In essence, the duration of employment seemed to be correlated with the prevalence of low back pain.^[14] also reported that teaching lessons with static posture, prolonged standing and sitting, and holding of the neck in the forward bend posture were all related to LBP and NSP for more than 14 hours per week.

Changing habitual patterns however requires postural awareness; this implies that postural awareness may be a key prerequisite in the process of adapting and maintaining healthy habitual postural and movement patterns in everyday life. Although numerous objective instrument-based measures of posture exist^[15,16], these can hardly be utilized outside of a laboratory setting and mostly measure posture under artificial conditions. To assess variations in everyday postural awareness without technical devices, self-report measures may be feasible, predictive of clinical changes and helpful as additional clinical and research tools.^[17]

It has been reported that the use of a lumbar support increasing lumbar lordosis can reduce LBP (Williams et al., 1991), and that chair backrests also help increase lumbar lordosis and decrease intradiscal pressure (Andersson and Ortengren, 1974; Andersson et al., 1979).

Makhsous et al. (2003) provided evidence that a sitting posture with a reduced ischial support enhanced lumbar support, and a backrest-seat pan angle set at 100, obtained with an instrumented laboratory chair, reduced sitting load on the lumbar spine and decreased lumbar muscle activity, which may in turn potentially reduce sitting-related LBP. Among the postural aspects of VDT work, the forearm position has also been identified as an element potentially affecting LBP.

In particular, supporting the forearm could decrease the perceived tension in the low back (Leivseth and Drerup, 1997; Dumas et al., 2008). Moreover, it is recognized that potential risk factors for LBP other than prolonged sitting may exist for these workers, such as work stress and psychosocial factors (Hoogendoorn et al., 2000; Hartvigsen et al., 2004)^[18]

In this, for quality of life measure using the Oswestry disability index [ODI] in the study which is showing that^[19] the purpose of using ODI is to assess pain related disability in persons with low back pain. this test is self-administered questionnaire. most of the client completed it in the 5 minutes and less than a minute to score it. The reliability of ODI is 0.71 to 0.87.

The World Health Organization (WHO) definitions of impairment, disability, and handicap are now widely accepted.¹⁶⁷ Discussion groups in 1991¹⁴⁶ and 1992²⁶¹ reviewed the available outcome measures for patients with back pain. Both groups concluded that the ODI was reasonably confined to disability according to the WHO definition. Many of the alternatives also attempted to measure impairment (pain) and some ranged into the areas of handicap as well. Handicap has been extremely difficult to measure by questionnaire. The ODI was deliberately focused on physical activities and not the psychological consequences of acute or chronic pain.^[19]

Some researchers have reported consistently higher ODI scores in women than men, but others have not confirmed this.^[19,20,21]

ODI interpretation is 0% to 20%: minimal disability: The patient can cope with most living activities. Usually no treatment is indicated apart from advice on lifting sitting and exercise. 21%-40%: moderate disability: The patient experiences more pain and difficulty with sitting, lifting and standing. Travel and social life are more difficult and they may be disabled from work. Personal care, sexual activity and sleeping are not grossly affected and the patient can usually be managed by conservative means. 41%-60%: severe disability: Pain remains the main problem in this group but activities of daily living are affected. These patients require a detailed investigation. 61%-80%: crippled: Back pain impinges on all aspects of the patient's life. Positive intervention is required. 81%-100%: These patients are either bed-bound or exaggerating their symptoms.^[19]

In this study , for measure the pain scale we are using NPRS. The NPRS is the simplest and the most commonly used numeric scale in which the patient rates the pain from 0 to 10. Its validity has been established with good correlations between NPRS and FPSR score in children. It is a subjective measure in which individuals rate their pain on an eleven point numeric scale. The scale is composed of 0 to 10. 0 means (no pain) and 10 means (worst imaginable pain).It has been shown that composite scoring system including best, worst and current level of pain over the last 24 hrs. was sufficient to pick up changes in pain intensity with maximal reliability.

Need of the study is there are very few studies done on giving treatment in form of ergonomics advice to see the impact on quality of life and pain on teachers with mechanical low back pain in Vadodara city.

Aim is to see the effect of ergonomics advice to see the impact on quality of life and pain on teachers with mechanical low back pain in Vadodara city.

Objectives are To evaluate the effect of ergonomics advice on quality of life, To evaluate the effect of ergonomics advice on pain score.

Hypothesised that null is There will be no significance of ergonomic advice on quality of life and pain in teachers with mechanical low back pain in Vadodara city, and alternate is There will be significant effect of ergonomic advice on quality of life and pain in teachers with mechanical low back pain in Vadodara city.

METHODOLOGY

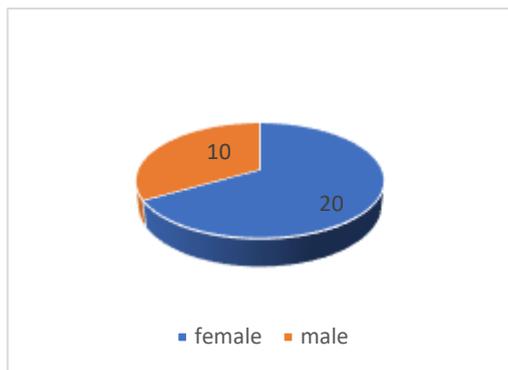
Data is taken from the Parul university. duration of intervention is 2 weeks. total study duration is 1 month. study design is experimental study. sample size is 20. Evaluation tool Numeric pain rating scale (pain) and Oswestry disability index (Quality of life) and Outcome measure are Pain score pre and post and Quality of life pre and post. Materials are Pen , Pencil, printed ergonomic advice manual card.

Inclusion criteria are Age 25-50 years, Teachers with working experience of minimum 1 year Exclusion criteria are Back pain with trauma , Any neurological symptoms involving Prolapsed Intervertebral Disc, Radiculopathy , Any systemic disease like RA, Ankylosing spondylitis etc., History of recent abdominal, back surgeries etc. Any contraindication for exercises. (fever, hypotension , recent fractures etc.), An inability to understand instruction, Less than one year of experience, Post menopausal women.

Procedure is Participants will be taken from Parul university according to the inclusion and exclusion criteria. prior to the study the participants will be provided information regarding the study and then consent will be taken. after that, evaluation of the participants by checking the score of ODI and pain score is measured by NPRS.

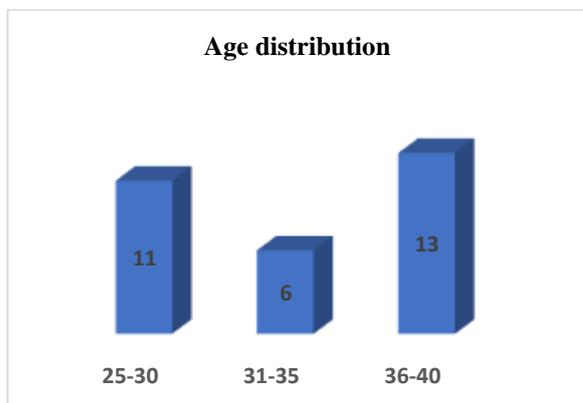
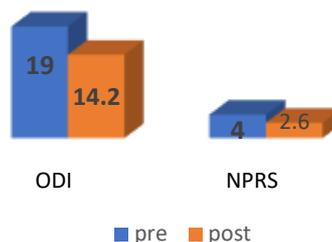
Outcome measurement will be taken will be pre and post.

RESULT

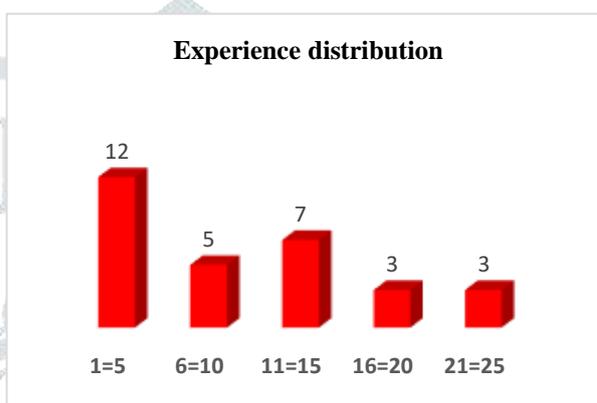


Graph : 1 gender distribution

PRE POST COMPARISON OF ODI AND NPRS



Graph : 3 age distribution



graph : 4 experience distribution

DISCUSSION

The study was directed at Parul University, Vadodara and participants were taken from the colleges of the university. There were total 41 participants were screened but according to inclusion criteria only 30 participants are included. The study is approved by the ethical committee of the institution.

Graph 1 shows the gender distribution. In that, there is 20 female and 10 male participants. Graph 2 shows that NPRS and ODI was effective in improving QOL and Pain. Non-parametric test (signed Wilcoxon level tests) respectively were used in internal comparisons of QOL and Pain. Graph 3 Age distribution between 21 to 25 years there were 4 participants, 11 subjects were in the 25 to 30 years, in between 31 to 35 years there were 6 subjects and 13 participants were in the 36 to 40 years. Graph 4 shows that experience distribution between 1 to 5 years was 12 participants, in between the 6 to 10 years frequency was 5 participants, in between the 11 to 15 years 7 subjects were included, 3 participants were in between the 16 to 20 years, 3 subjects were in the 21 to 25 years and 3 participant in 26 to 30 years of experience.

For comparison of pre and post of QOL there is pre value of mean was 19 and after treatment 14.2 value. For comparison of pain there is pre value of mean is 4 and post value of mean was 2.6. the result showed that after giving the treatment the QOL score is decreased and pain score is also decreased.

A study which is done by paolo pillasrini. Is telling that “The ergonomic intervention at the workstation improved work-related posture and was effective in reducing LBP point-prevalence both in the first study period and after crossover, and these effects persisted for at least 30 months.”

The study concluded that the ergonomics advice are effective to improve the participants QOL and helps to reduce the pain.

Limitation of the study are The study was done over a small sample size, Study was conducted over a short period of time, No follow up could be done to see the long-term effect. Further recommendation of the study are Study can be done with larger sample size, Study can be done in different population, Study can be done with a greater number of treatment sessions and follow up.

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