

Efficacy of Postural Re-Education and Core Strengthening Exercise with Thera-Band Among Tempo-Traveller Drivers with Chronic Low Back Pain

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Abstract—**BACKGROUND:** Chronic low back pain (CLBP) poses a significant occupational health concern among tempo-traveller (TT) drivers, impacting their well-being and job performance. **OBJECTIVE:** The research investigates the comparative efficacy of postural re-education and conventional physiotherapy in managing CLBP among TT drivers. A randomized controlled trial was conducted, involving a sample of TT drivers diagnosed with chronic low back pain. **METHODOLOGY:** Participants were randomly assigned to two groups: one receiving postural re-education interventions and the other undergoing conventional physiotherapy treatments mainly focusing on core muscle strengthening with the help of Thera-band. Outcome measures used for this study are VAS score and ODI. The study assessed the effectiveness of these interventions based on pain intensity, functional disability, and quality of life measures. Additionally, biomechanical analyses were employed to evaluate postural changes in both groups. Results indicated that both postural re-education and conventional physiotherapy demonstrated substantial improvements in reducing pain intensity, enhancing functional ability, and ameliorating overall quality of life among TT drivers with CLBP. **RESULTS:** Postural re-education exhibited a distinct advantage in promoting sustainable change in driving posture, potentially preventing the recurrence of low back pain in the long term. These findings contribute to the growing body of knowledge on effective interventions for chronic low back pain (CLBP) among occupational drivers, emphasizing the importance of ergonomic considerations and posture awareness in occupational health management. Further research is warranted to explore the long-term effects of these interventions and their broader applicability in diverse occupational settings.

Index Terms—chronic low back pain, postural re-education, core muscle strengthening, rehabilitation, ergonomics.

1. INTRODUCTION

The term "chronic low back pain" (CLBP) refers to discomfort that lasts for more than three months or longer towards the normal recovery timespan. It is one of the most prevalent and exposed- familiar musculoskeletal issues in contemporary culture [1]. CLBP is a significant health and economic issue and the second largest cause of disability globally. It is said that low back pain develops in the lumbar region for a variety of reasons [2]. In addition to having a substantial impact on functional ability and occupational activities, psychological variables including stress, depression, and/or anxiety can also have an impact on CLBP. The most important risk factors for chronic pain that have been found to include a history of low back pain in the past, job frustration, sciatica involvement, the degree of physical disability, and, to a lesser extent, poor psychological status generally and an inadequate social foundation.[2]. Symptoms include: Lower back pain, specifically in the lumbar and sacroiliac areas, which may spread to the lower limbs, problems with coordination and movement, difficulty staying in a sitting, standing, or laying position, as well as trouble staying in the neutral position, particularly if there is pain radiating to the lower extremities, bending over or carrying things in your arms can also cause discomfort, people with CLBP may find daily tasks like cleaning, playing sports, and engaging in

other recreational activities to be quite difficult, a patient experiencing generalised pain may also experience impaired sensory perception, there may be depressive thoughts, fear-avoidance beliefs, and pain. Posture is not a static position but a complex pattern of reflexes, behaviours, and adaptive reactions to something that prevents or resists being functional or straight thanks to the coordinated action of numerous muscles used to maintain stability^[3]. Postural re-education or global posture re-education (GPR) asserts that in order to prevent postural asymmetry, consists of a sequence of vigorous, moderate movements and postures that are meant to realign joints, stretch shortened muscles, and strengthen the contraction of antagonist muscles. The significance of good posture should be underlined, and keeping good sitting posture is particularly crucial because sitting puts more strain on the back than standing or lying down, but there may still be some variations in these positions^[4]. The body of research generally acknowledges that, in addition to sitting posture, consistent postural movement throughout extended durations of sitting may delay the onset of musculoskeletal diseases^[5]. The treatment of movement disorders brought on by impairments to joints and the muscles that move them is known as conventional physiotherapy. In individuals with non-specific chronic low back pain, core stability has a significant positive therapeutic impact on quality of life, activation and thickness of the core muscles, and pain intensity and functional impairment^[6]. Yoga and core or stabilisation exercises were statistically significant in increasing physical function in patients with CLBP when compared to traditional rehabilitation and no intervention^[7].

2. NEED FOR STUDY

In day-to-day life low back pain is very common condition seen in drivers. To know the problem of drivers due to back pain in their daily life and to reduce pain, improve functional activity by using postural correction and core muscle strengthening with Thera-band. To evaluate the effectiveness between the postural re-education and core muscle strengthening with Thera-band.

3. OBJECTIVE

To collate the efficacy of postural re-education technique and core strengthening exercise using Thera-band methods in lowering low back pain in tempo-traveller drivers.

4. REVIEW OF LITERATURE

1. Teresa Paolucci et al, Carmine Attanasi and Walter Cecchini (2019). Chronic low back pain and posture rehabilitation exercise: a literature review. *Journal of Pain Research*. 2019;12 95–107, conducted a literature review and concluded that pain and impairment can be effectively reduced by utilizing a variety of rehabilitative techniques, such as Pilates, McKenzie, Feldenkrais, Global Postural Rehabilitation (GPR) and Proprioceptive Neuromuscular Facilitation (PNF). Group exercises from back school (BS) have been shown to be effective in improving mental health and quality of life. Exercise treatment has variability in approaches despite its moderate effectiveness. Inclusion criteria were the articles released during the previous five years, randomized clinical trials, patients with mean ages between 18 and 70, and complete English texts and the exclusion criteria included case reports, observational studies, full-text or abstract-free publications, complementary and alternative medicine, and other forms of rehabilitation. The research covered articles that were published from 2012 to 2017. The study concluded that to ascertain the superiority of the procedures and validate their impacts, more superior study must be conducted in addition to using more suitable evaluation metrics. Similar decreases in pain perception were observed in the groups performing stationary cycle workouts and trunk exercises, according to Paul WM Marshall's study. Areeudomwong P et al's study showed that PNF training improves pain related outcomes over the long term and enhances lower back muscular activity in patients with Chronic Low Back Pain, which has implications for disability and function.
2. Vishnu Bhure, Dr.Lajwanti Lalwani (2021). Prevalence of Low Back Pain in Security Personnel in Vidarbha region of Maharashtra,

India: A cross-sectional study. The purpose of the study is to use the Oswestry impairment Questionnaire to evaluate the impairment related to low back pain in security personnel. The inclusion criteria of this study consisted of individuals aged 18 to 60, those who were employed full-time as security guards and put in at least eight hours a day at work, the complaint of three months' worth of low back ache were also included. On the other hand, prior spinal surgery and part-time employment were the only requirements. This condition was included in order to exclude any complex populations. Samples and questionnaires were the two ways they employed. Based on the results, 30.77% of respondents had a minimum disability, 47.69% had a moderate impairment, 18.46% had a severe disability, and 3.08% had a crippled disability. When comparing working 6–10 hours to longer hours, there was a decrease in impairment. The study concluded that musculoskeletal problems cause substantial incapacity in security personnel, ergonomic techniques and breaks are recommended to offset the effects of prolonged standing, since limited to moderate degrees of impairment due to low back pain were seen.

3. Sai Kripa, Harmanpreet Kaur (2021). Identifying relations between posture and pain in lower back pain patients: a narrative review. Suggested a narrative review to determine the relationship between pain and posture. Postural alterations were considered, including anterior pelvic tilt, lumbar lordosis, leg length discrepancy, and tissue adaptive responses. Mainly they focused on to find if there is any association between posture and low back pain. Determined that low back discomfort with a high severity is not being caused by those who work or engage in particular awkward postures. Additionally, they discovered that physical leisure activities including sports and exercise, sitting, and prolonged standing or walking had no relationship to lower back pain. It demonstrates that, irrespective of the anatomical reason, lower extremity shortening is not a significant contributing factor to chronic back pain. The study also looked at if there was any correlation between lower extremity limb length differences longer than 5 cm and LBP in the individuals. Since poor posture results in tissue

damage, which is not the same as pain in any case, posture cannot be the cause of pain. This is due to the fact that pain is multifaceted and that tissue damage is only one element contributing to pain. It is not advisable to keep your posture straight all the time. We can lessen discomfort by maintaining a comfortable posture. The relationship between posture and pain is minimal since people with low back pain do not seem to be significantly correlated with maintaining an upright, static posture.

4. DeokJu Kim, MiLim Cho (2015). Effect of an exercise program for posture correction on musculoskeletal pain. The purpose of the study was to look into how musculoskeletal discomfort was affected by an exercise programme for correcting posture. The present research study comprised 88 students from S university in K city, 34 of whom were male and 54 of whom were female. The participants' mean ages were 23.4 and 21.1 years for the males and females, respectively. For eight weeks, the exercise programme consisted of three sessions per week, lasting twenty minutes each, with an emphasis on correcting posture. A pain scale was used to measure pain both before and after the programme. The outcomes showed a notable decrease in pain, especially in the lower back, middle back, and shoulders. The results imply that the exercise regimen successfully reduced low-back, mid-back, and shoulder pain, possibly increasing students' and people with sedentary jobs' productivity at work. Overall, individuals noticed lower pain levels after the exercise programme, with significant differences noted in the shoulders, middle back, and lower back. Higher pain levels were seen in female participants, those who sat for longer periods of time, and people who had particular seating behaviours (such as slouching). Lower pain levels were linked to regular activity. The study finds that low-back, mid-back, and shoulder pain were all significantly decreased by the posture correction exercise programme. The results point to the possible advantages of these programmes in terms of increasing students' and people with sedentary jobs' work efficiency.
5. Alexander R. Kett, Freddy Sighting (2021). The Effect of Sitting Posture and Postural Activity on

Low Back Muscle Stiffness. Highlights the concerning public health problem of sedentary behaviour, especially in industrialised countries where extended sitting is common. Truck drivers are cited as an example of a professional driving group that is especially susceptible to prolonged periods of inactivity. The health hazards linked with this include a higher chance of dying young, disorders related to the heart and metabolism, and discomfort in the musculoskeletal system. Moreover, there is a higher chance of low back pain for drivers in general and professional drivers in particular. The researchers used 16 volunteers (7 female and 9 male) in a study to look into the effects of extended sitting on musculoskeletal health. Using previously released data, a priori power analysis was used to calculate the sample size, participants' average height was 176.9 ± 10.0 cm, and their average weight was 73.7 ± 10.4 kg. Each participant had to be in good health and free from any ailments or injuries that could impair their ability to sit normally. In order to prevent potential muscular fatigue and altered muscle stiffness, they had to stop engaging in moderate to intense physical activity 24 hours prior to the experiment. The study's technique comprised evaluating the stiffness of the lower back muscles and capturing lower back kinematic data during a 4.5-hour sitting session. The results showed that throughout the 4.5-hour sitting period, there was a substantial 15.7% increase in lower back muscular stiffness. Furthermore, the Friedman test analysis of sitting postures showed that there was no discernible difference between flat and lordotic positions, and that individuals remained in kyphotic postures for a considerable amount of the time. There were no discernible relationships between the degree of postural activity and the increased muscle stiffness or between the increased muscle stiffness and a kyphotic sitting posture. This unexpected result raises the possibility that additional variables not included in the study could be involved in the changes in muscular stiffness that are seen during extended periods of sitting. Highlights how intricately sitting habits, postures, and their effects on musculoskeletal health are related. It emphasises the necessity of more investigation into these complex linkages and the identification of other

factors that might contribute to the changes in muscle stiffness that are noticed after prolonged sitting. The results of this study will be essential in creating suggestions and initiatives that will lessen the negative impacts of sedentary behaviour on public health.

6. Antonio Frizziero, Giacomo Pellizzon (2021). Efficacy of Core Stability in Non-Specific Chronic Low Back Pain. This study provides a summary as Therapeutic exercises are one of the many treatments used in the multimodal management of persistent low back pain. Enhancing spinal stability, neuromuscular control, and preventing shear force—which can result in lumbar spine injuries—are the goals of core stability exercises. A thorough search of popular databases, including as Pedro, PubMed, and the Cochrane Library, was carried out by the researchers. The scope of the search was restricted to English-language articles that were released between January 2005 and November 2020. Of the 420 items, 371 were discarded, and 49 fulfilled the inclusion requirements. Patients with non-specific persistent low back pain showed notable therapeutic benefits from core stability exercises. Improvements in quality of life, activation of the core muscles, muscle thickness, and reduced pain intensity and functional impairment were among the advantages. The Conclusion of the study was, core stability exercises may be an important part of a complete strategy for treating persistent low back pain but it Suggests encouraging the integration of different therapeutic exercise methods with core stability training and also they have highlighted how crucial patient compliance is to figuring out how effective the intervention is.
7. Ying Li, Lei Yan (2023). Exercise intervention for patients with chronic low back pain: a systematic review and network meta-analysis. The network meta-analysis of the 75 randomised control trials in the study, which had 5254 individuals, found that sling exercise, yoga, Pilates exercise, and tai chi demonstrated a greater reduction in pain than no intervention at all. Compared to traditional rehabilitation, yoga and core stabilisation exercises demonstrated a greater increase in physical function. The conclusion of the study was that Tai chi, yoga, Pilate's exercises, sling exercises, motor control exercises, and core or

stabilisation exercises significantly improved patients' CLBP when compared to standard therapy and no intervention. Yoga and core or stabilisation exercises were statistically significant in increasing physical function in patients with CLBP when compared to traditional rehabilitation and no intervention. Before additional extensive and high-quality RCTs are carried out, it is challenging to give a firm recommendation because of the limits of the amount and quality of the included research.

8. Apirati Kasemsan, Leonard Joseph and Aatit Paungmali (2021). Prevalence of musculoskeletal pain and associated disability among professional bus drivers: a cross-sectional study. *International Archives of Occupational and Environmental Health* (2021). The study utilized a cross-sectional design, collecting data from professional bus drivers in Northern Thailand between 2019 and 2020. The focus was on investigating the prevalence of musculoskeletal pain (MSP) and associated disability among bus drivers. The primary aim is to investigate the 12month prevalence of MSP and associated disability among bus drivers in Northern Thailand. They intended to serve as a foundation for developing a nationwide database on the prevalence of MSP among bus drivers. The inclusion criteria for bus drivers aged 30-60 years, with a minimum of 1 year of professional driving experience, working full-time, driving at least 5hours per day, having no prior traumatic injuries or medical help for MSP. A total of 83 full time bus drivers participated. Individual characteristics, including smoking history, drinking history and BMI were collected, occupational characteristics such as years of experience and driving hours per day and week were conducted. Standardized Nordic Musculoskeletal Questionnaire (SNMQ) was used to assess MSP prevalence over the last 7days and 12months. Disability associated with low back pain was measured using the Oswestry Disability Index (ODI). Other scales like the Neck Disability Index (NDI) and Shoulder Pain and Disability Index (SPADI) were used to assess disability associated with neck pain and shoulder pain respectively. Written informed consent and ethical approval was obtained from participants and a university institutional ethics committee. A
9. Sandul Yasobant, Madhan Chandran and Endreddy Manikanta Reddy (2015). Are bus drivers at an increased risk for developing musculoskeletal disorders? An ergonomic risk assessment study. Article in *Journal of Ergonomics*. The study aims to contribute valuable insights into the current exposure and risk levels for WMSDs among bus drivers in Chennai City, with a particular emphasis on ergonomic factors and work-related conditions. The sample included 280 bus drivers experiencing acute body pain, they were selected through simple random sampling. Exclusion criteria were applied to exclude bus drivers with a history of traumatic road or work accidents. The data collection involved structured pre-tested interviews using standardized and pre-validated tools which included the Driver Seat Ergonomics Questionnaire, Quick exposure Check (QEC), Rapid Entire Body Assessment (REBA) and the Nordic Musculoskeletal Questionnaire (NMQ). Mean age of the bus drivers was 34.6 ± 9.5 years, mean weight 60 ± 11 kg, more than 60% of drivers had been driving for over 5 years, approximately 80% of drivers were smokers and about 68% of the subjects reported occasional alcohol consumption. The study suggests that seat design is a direct contributing factor to postural related physical pain, emphasizes the importance of considering the physical characteristics of the driver and necessary accommodations for full seat adjustments. The study acknowledges its limitations, and adds valuable evidence to the understanding of unsafe ergonomics among bus drivers, emphasizing the need for targeted interventions and health promotion strategies to mitigate the risk of work-related musculoskeletal disorders in this occupational group.

10. Fedrico Arippa, Bruno Leban and Massimiliano Pau (2019). Postural strategies of bus drivers during a regular work shift in urban area. A pilot study. Proceeding of the human factor and ergonomics society 2019 annual meeting. The study involved seven male professional bus drivers employed by the public transport company in Olbia, Italy. Their age 51.4 ± 6.6 years, stature: 167.8 ± 4.4 cm and body mass 78.8 ± 15.4 kg and working experience in the transportation sector: 20.8 ± 5.8 years. Each test session involved a 6-hour shift, mirroring the actual work shifts and the participants were instructed to maintain a posture as natural as possible, contact pressure at the body-seat interface was continuously acquired throughout the entire period. Scheduled 10-minute rest breaks were provided to all drivers at the bus terminal approximately every 50 minutes of continuous driving, which resulted in a total of 6 breaks during the entire shift. The discomfort ratings questionnaire used a 6-point scale for local discomfort and part 2 of the questionnaire described overall discomfort and utilized an adapted version of the Borg CR100 scale. This study appears to focus on assessing the discomfort experienced by bus drivers during their regular work shifts, considering both local and overall discomfort, inclusion of rest breaks and the evaluation of contact pressure aims to provide a comprehensive understanding of the ergonomic challenges faced by the bus drivers in their work environment.
11. Ashlesha Kulkarni, Janhavi Atre and Rasika Kaluskar (2022). Prevalence of disability due to low back pain in MSRTC bus drivers of Pune, India. International journal of health sciences and research. Vol 12 issue: 4 April 2022. The study received approval from the Institutional Ethical Committee at the Department of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune. Approximately 180 bus drivers from various bus depots in Pune were approached for participation and 164 bus drivers provided consent. The inclusion criteria for the study were male bus drivers aged between 30-50 years with a regular 8 hour driving routine, suffering from low back pain and drive bus for more than 5 years. Exclusion criteria was drivers with low back pain due to factors other than mechanical reasons, those currently undergoing treatment for low back pain and those unwilling to participate. Basic demographic data of the drivers were collected and were given the Modified Oswestry Disability Index scale to assess the percentage of the disability. According to the results of the study, low back discomfort caused a moderate level of disability for 70% of bus drivers and identifies the heavy physical work, lifting and forceful movements, bending and twisting, whole body vibration and static work postures as significant factors for occupation-related low back pain. Continuous exposure to these factors over a prolonged period may overcome protective mechanisms at microscopic levels in the spine tissues. The findings of the study highlight the multifunctional nature of low back pain among bus drivers, encompassing work related factors, lifestyle choices and potential lack of awareness regarding these risk factors. Emphasizes the need for interventions and awareness programs to address and mitigate these issues
12. Wen-Dien Chang, Hung-Yu Lin (2015). Core strength training for patients with chronic low back pain. The primary objective of the study is to investigate the effectiveness of various core strength training strategies for patients with chronic low back pain. Since there was no standardized system for analyzing and comparing the results of core strength training and typical resistance training in the context of chronic low back pain the researchers conducted a systematic review by searching electronic databases for relevant studies and quality of identified studies was evaluated by analyzing the reported data. Four methods of evaluating core strength training were compared: trunk balance, stabilization, segmental stabilization, and motor control exercises. According to the results obtained from various scales and evaluation instruments, core strength training was found to be more effective than typical resistance training in alleviating chronic low back pain and recommend focusing on training the deep trunk muscles for optimal results. The systematic review concludes that the core strength training, particularly when targeting the deep trunk muscles. Is effective in alleviating the chronic low back pain and beneficial for the patients.

13. Tarun Kumar, Suraj Kumar (2015). Efficacy of core muscle strengthening exercise in chronic low back pain patients. The study aims to evaluate the effect of core muscle strengthening intervention on the chronicity of chronic low back pain. Thirty patients were recruited from the outpatient department of the National Institute for the Orthopedically Handicapped and were divided into two groups: A and B based on the duration of low back pain. Group A consisted of patients with pain duration of more than 12 months and Group B consisted of patients with pain duration from 3-12 months. Both the groups received the same intervention for six weeks, assessments were conducted pre-intervention and post-intervention after 6 weeks for both the groups. The groups showed improvement in all outcome measures, including pain and function. The outcome measures included Numerical Pain Rating scale, Oswestry Disability Index, Sorensen test, Gluteus Maximus Strength, Activation of Transversus Abdominis and Modified-Modified Schober's Test. Improvements were statistically non-significant between groups but significant within each group. The study concluded that core muscle strengthening exercise combined with lumbar flexibility and gluteus maximus strengthening is an effective rehabilitation technique for all chronic low back pain patients. The effectiveness was observed irrespective of the duration of pain and suggests that a comprehensive approach involving core muscle strengthening, lumbar flexibility, and gluteus maximus strengthening can be beneficial for individuals with chronic low back pain, emphasizing the importance of tailored rehabilitation techniques for managing chronic low back pain.
14. Aliaa M Elabd, Omar M Elabd(2021). Relationships between forward head posture and lumbopelvic sagittal alignment in older adults with chronic low back pain. The study was to examine the relationships among pain intensity, forward head posture (FHP) and lumbopelvic sagittal alignment in chronic mechanical low back pain patients. A cross-sectional study involving 100 patients was conducted whose pain intensity was assessed using a numerical pain rating scale. Standardized standing lateral radiographs were analyzed to measure spinopelvic angles and data analysis involved correlation coefficients and regression analysis. Results of the study are as follows: Sacral slope and pain severity demonstrated very substantial positive associations with lumbar lordosis, sacral slope and pain intensity showed a significant positive association. There were found to be moderately positive relationships between craniovertebral angle and pelvic tilt, marginally favorable connections found between each sacral slope and pelvic tilt and pelvic incidence, pelvic tilt was found to have strong negative relationships with sacral slope, lumbar lordosis, and pain intensity. Pain severity, lumbar lordosis, and sacral slope all showed somewhat unfavorable relationships with craniovertebral angle. Pelvic incidence, however, did not correlate with lumbar lordosis, craniovertebral angle, or discomfort and the pain multi-regression equation prediction model was greatly impacted by the correlation between measured variables and demographic data, which accounted for 76.60% of the variation in pain.
15. Magdalena Plandowska, Agnieszka Kedra (2022). Trunk alignment in physically active young males with low back pain. Aim of the study was to assess differences in trunk alignment parameters based on the level of physical activity in individuals with and without low back pain. Forty-three participants with low back pain and thirty seven healthy individuals were recruited and divided into two subgroups based on their level of physical activity. Group 1 consisted of participants with a moderate level of physical activity (MPA) and Group 2 consisted of participants with a high level of physical activity (HPA). An original questionnaire was used to assess the prevalence of low back pain and for metric 4D raster stereographic system was employed to measure spinal posture. No significant differences were found between the two groups for various trunk alignment parameters, including trunk imbalance, inclination, torsion, pelvic tilt and lordotic angle. The study suggested that engaging in physical activity may have a positive impact on trunk alignment in males with low back pain, particularly in individuals under the age of 25, there is a potential role of physical activity in

maintaining or improving spinal posture in the context of low back pain.

16. Shu-Hao Du, Yong-Hui Zhang (2023). Spinal posture assessment and low back pain. Emphasized that postural assessment is valuable for doctors and therapists to identify risk factors for low back pain and determine appropriate follow up treatment, small asymmetries in postural alignment can be normal and represent criteria for postural evaluation. It is essential to comprehensively observe the patients posture in all the directions and the factors related to posture evaluation should be thoroughly analyzed. Results of the study indicate that intra-rater reliability is greatly higher than inter-rater reliability, inclinometers are reported to be more reliable than other instrumentation methods. Some common postural problems can lead to lumbar discomfort and prolonged poor posture is identified as a potential risk factor for lumbar spine injuries. The results emphasize the necessity for a unified standardized method for posture evaluation in the future research which will contribute to consistency and comparability across different studies.
17. Jency Thangasheela G, T.P Bhuvaneshwari (2021). Analysis of work-related musculoskeletal pain in bus drivers, journal of nursing and health science (IOSR-JHNS) volume10, issue 5ser II. The survey aimed to analyze work-related musculoskeletal pain among bus drivers using a self-designed questionnaire. A total of 100 bus drivers were involved aged 28-58 conducted at Gobichettipalayam Bus stand, Sathyamangalam Bus stand and Coimbatore Bus Stand. Thirty five questionnaires with a Numerical Pain Scale were used which consisted questions of personal factors, prevalence of musculoskeletal pain and occupational factors such as work station design, working environment and working format. Inclusion and exclusion criteria of the sample were 28-58 years, males and bus driving for a minimum of 5 hours, drivers with any preexisting musculoskeletal pain or pain from accidents, age below 28 and above 58 respectively. Participants filled out the questionnaire which was then collected and analyzed, study was approved by the institutional ethical college of Cherraans College of Physiotherapy. Study revealed a high

prevalence of low back pain among drivers with an indication of 85% experiencing low back pain. The contributing factors to low back pain were uncomfortable seat position, prolonged sitting, whole body vibration, traffic congestion, inadequate lumbar support, awkward postures and bad road conditions. Concluding that ergonomic considerations in the design of the drivers' seats may be crucial in alleviating the risk of low back pain among bus drivers, significant associations between work-related factors, psychosocial stress and the prevalence of musculoskeletal pain among bus drivers.

5. MATERIAL AND METHODOLOGY

Study design - Pilot study

Sampling: convenience method

Sampling size: 60 individuals (n=30)

Group A: posture re-education

Group B: core muscle strengthening with Thera-band

Study duration: 12 weeks

Procedure: postural re-education for group A and core muscle strengthening with Thera-band in group B.

Study place: Travel companies.

Outcome measures: VAS score (Visual Analogue scale), ODI (Oswestry Disability Index)

Inclusion criteria—

- Tempo-Traveller drivers who continues to drive formore than 6 hours.
- Age group: between 30-55 years
- Gender: only Male.
- Low back pain with/without radiculopathy, for more than 4 weeks.

Exclusion criteria –

- Under medication/s (Pain killer, analgesic). Psychological disorder (short term/long term).
- Recent surgery in and around lumbar region.
- Any skin disease or infection.
- Lumbar instability and any other degenerative disorder.
- PIVD (Prolapsed, herniated, or extruded intervertebral disc).
- Herniated Disc

6. PROCEDURE

GROUP A: Posture Re-education; the group were taught with various postural adaptations while driving and after driving such as body contact with their seat, using lumbar support, distance between their seat and the steering wheel and legs reaching the accelerator, drivers were advised to take short intervals while driving alongside simple head and neck, shoulder and spine stretches were advised to be performed in order to minimise the stress on muscles which can be performed while waiting for their passenger or during a traffic signal, the hand placement of the driver on the steering wheel were all taken into consideration.

GROUP B: Core muscle strengthening with the help of Thera-band. Each session of core muscle strengthening lasted about 30mins, thrice a week with slight warm up exercises, mainly focusing on the deep trunk muscles (transversus abdominis, multifidus, quadratus lumborum, rotators). During the initial weeks of the study during the participants were not provided with the Thera-band, as the progress was noticed the resistance was involved with the help of Thera-band and slowly increased the amount of tension. Subjects were asked to be in supine or prone position depending on the type of exercise being performed.

7. ETHICAL CONSIDERATION

1. The study was approved by the research ethical committee and formal permission was taken from concerned authorities.
2. Informed consent was obtained during the study.
3. The subjects were informed that their data will be confidentially maintained.
4. The subjects were informed prior that their participation was on voluntary basis and they can withdraw from the study at any time.
5. There are no ethical issues during the study.

The participants underwent exercise accordingly under the supervision of a physiotherapist after which pre and post value were analysed and data was managed by MS word 2013 and it is analysed by SPSS17.

8. STATISTICS ANALYSIS

- VAS and ODI scale were used as outcome measures, which were assessed pre and post the exercise sessions. Initially first week was taken as base period which is compared with other time factor combination allays. Different variables were studied in between the 1st week - 8th week.
- For the two-groups, paired t test was used to compare the pre and post values of VAS and ODI scales. Some tests were used for other parameters too.
- The mean VAS score and ODI score for Tempo-Traveller drivers with chronic low back pain reduction by using postural re-education method is significant.
- Based on the results, we can state that independent samples paired t are as follows:

GROUP A: POSTURAL RE-EDUCATION

- There is a significant difference in mean PRE-VAS score in Tempo-Traveller drivers with chronic low back pain with posture re-education ($t=23.16$).
- There is significant difference in mean POST-VAS score in Tempo-Traveller drivers with chronic low back pain with posture re-education (0.36).
- There is significant difference in PRE ODI score in Tempo-Traveller drivers with chronic low back pain with posture re-education ($t=25.02$).
- There is significant difference in mean POST ODI score in Tempo-Traveller drivers with chronic low back pain with posture re-education (0.13).

GROUP B: CORE STRENGTHENING WITH THERA-BAND

- There is a significant difference in mean PRE-VAS score in Tempo-Traveller drivers with chronic low back pain with core strengthening using Thera-band ($t=18.90$).
- There is significant difference in mean POST-VAS score in Tempo-Traveller drivers with chronic low back pain with core strengthening using Thera-band (0.32).
- There is significant difference in PRE ODI score in Tempo-Traveller drivers with chronic low back pain with core strengthening using Thera-band ($t=1.590$).
- There is significant difference in mean POST ODI score in Tempo-Traveller drivers with chronic

low back pain with core-strengthening using Thera-band (1.44).

Paired Samples Statistics

		Mean	N	Std. Deviation
Pair 1	pre- ODI	22.9380	30	7.12583
	Post-ODI	12.4973	30	6.23408
	pre-VAS	5.70	30	1.950
	post VAS	2.50	30	1.548
Pair 2	Pre-ODI	21.2987	30	7.93476
	post-ODI	16.3400	30	7.15324
	pre-VAS	5.23	30	1.775
	post-VAS	3.00	30	1.486

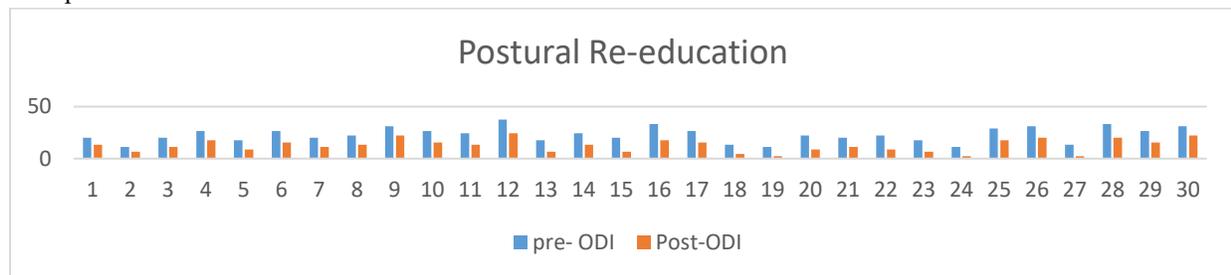
Paired sample t test

		Paired Differences				t	P value
		Mean	Std. Deviation	95% Confidence Interval of the Difference			
				Lower	Upper		
Pair 1	pre- ODI - Post-ODI	10.440	2.272	9.592	11.289	25.162	.000
Pair 2	pre-VAS - post VAS	3.200	.761	2.916	3.484	23.028	.000
Pair 3	Pre-ODI - post-ODI	4.958	1.70723	4.32118	5.59616	15.909	.000
Pair 4	pre-VAS - post-VAS	2.233	.679	1.980	2.487	18.018	.000

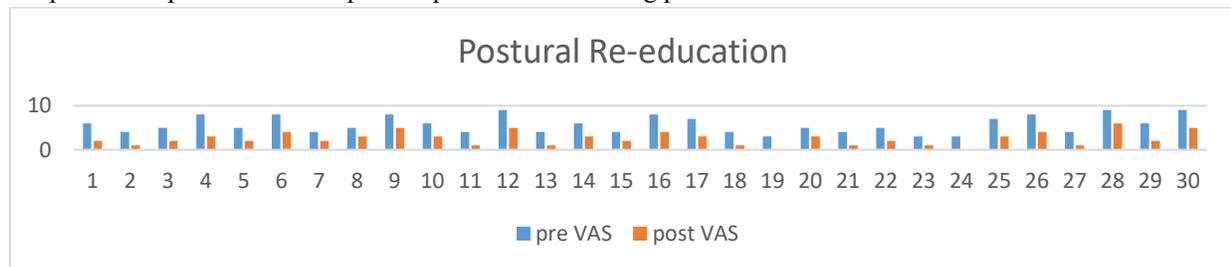
$P < \alpha$ is considered as significant ($0.000 < 0.05$)

Conclusion: There is a significant difference between pre-VAS and post VAS, pre-ODI and post ODI in the group receiving postural re-education.

Group A: POSTURAL RE-EDUCATION

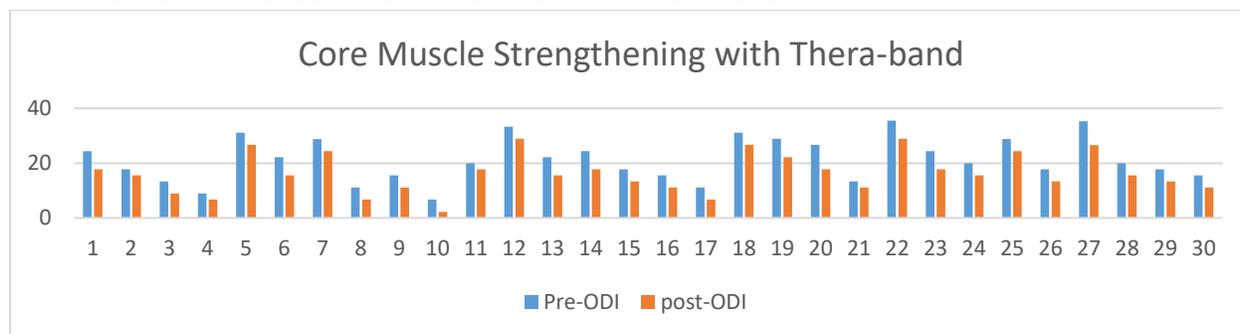


Graph A: Comparison between pre and post ODI score using posture re-education.

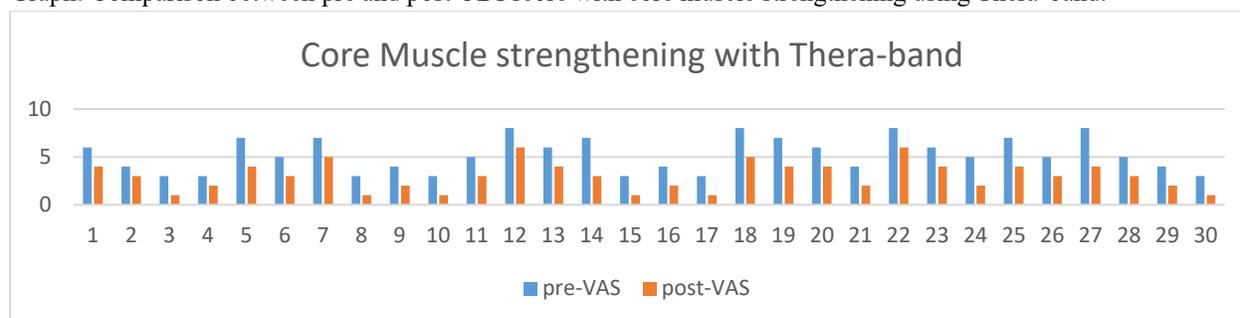


Graph B: Comparison between pre and post VAS score using posture re-education.

GROUP B: CORE MUSCLE STRENGTHENING WITH THERA-BAND



Graph: Comparison between pre and post ODI score with core muscle strengthening using Thera-band.



Graph: Comparison between pre and post VAS score with core muscle strengthening using Thera-band.

9. DEMOGRAPHIC DATA

Descriptive Statistics

	N	Mean	Std. Deviation
Age1	30	43.77	5.894
Age2	30	45.23	5.380

10. CONTRIBUTION MADE

- The core muscle strengthening exercises were easy to perform without much pain and it was non-invasive.
- Posture re-education positions were also simple which can be inculcated in their everyday driving.
- It is cost effective, when compared with other interventions for chronic low back.
- Posture and exercises improve the overall functional outcome and fitness.
- Thera band helped to strengthen the core muscles especially the deep trunk muscles in the TT drivers.
- Analysed data helps us to conclude the study.

11. CONCLUSION

Results indicated that both postural re-education and core muscle strengthening using Thera-band demonstrated substantial improvements in reducing pain intensity, enhancing functional ability and ameliorating overall quality of life among Tempo-Traveller drivers with chronic low back pain (CLBP). However, Postural re-education exhibited a distinct advantage in promoting sustainable change in driving posture, potentially preventing the recurrence of low back pain in the long term. These findings contribute to the growing body of knowledge on effective interventions for chronic low back pain (CLBP) among occupational drivers, emphasizing the importance of ergonomic considerations and posture awareness in occupational health management.

Further research is warranted to explore the long-term effects of these interventions and their broader applicability in diverse occupational settings.

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