

Efficaciousness of Y-shaped kinesio taping in conjunction with core stability exercises on amelioration of chronic non-specific low back pain: A pre-post study

Deepannita Awasthi ^{1*}, Digvijay Sharma ²

¹PhD Scholar, School of Health Sciences, Chhatrapati Shahu Ji Maharaj University, Kanpur, Uttar Pradesh, India – 208024
Email ID : dawasthi2496@gmail.com ORCHID ID : [0009-0002-5096-250X](https://orcid.org/0009-0002-5096-250X)

²Associate Professor & Director, School of Health Sciences, Chhatrapati Shahu Ji Maharaj University, Kanpur, Uttar Pradesh, India – 208024
Email: digvijaysharma@csjmu.ac.in ORCHID ID : [0000-0002-6999-300X](https://orcid.org/0000-0002-6999-300X)

ABSTRACT

CNSLBP is a prevalent condition, a musculoskeletal issue that results in functional impairments and leading cause of disability. The study assesses the effect of ‘Y’ shaped Kinesio taping combined with core stability exercises. Kinesio taping is particularly useful for pain alleviation, whereas CSE is focused on enhancing trunk muscle activation.

Material and Methods- The study examines the treatment’s efficacy under several settings (working and resting states). In this study, a purposive and judgemental sampling strategy was employed, with n=31 individuals meeting with inclusion criteria, the numerical pain rating scale (NPRS=11) was utilised to assess pain levels.

Result- The treatment’s overall efficacy was validated by the negative -z-values from the Wilcoxon signed rank test, with resting pain Z=-4.949 and work pain Z=4.126(both p<0.001), indicating that post -intervention pain scores were consistently lower than pre-intervention scores.

Conclusion-Patients with persistent CNSLBP derive benefits from the treatments regarding both resting and occupational discomfort. A more substantial improvement was observed during rest periods; patients were more benefited.

KEYWORDS: Chronic non-specific low back pain, Core stability exercises, Numeric Pain rating scale, Kinesio taping

How to Cite: Deepannita Awasthi , Digvijay Sharma , (2025) Efficaciousness of Y-shaped kinesio taping in conjunction with core stability exercises on amelioration of chronic non-specific low back pain: A pre-post study, Vascular and Endovascular Review, Vol.8, No.4s, 247-253.

INTRODUCTION

Low back pain is documented in 80-85% of primary care visits with musculoskeletal problems, resulting in a significant burden on healthcare systems and society, chronic non-specific low back pain is enduring lumbar discomfort beyond twelve weeks, without a defined anatomical or clinical origin. It may be associated with radiated or referred pain in the lower limb. The research indicates a greater prevalence in women, affecting person of various age group, associated with multiple contributory factors, a conclusive underlying cause is discovered in merely 12-15% of cases. The cause encompass age, obesity, health issues or lumbopelvic instability. [1] Non-specific low back pain (LBP) is characterized as axial or non-radiating discomfort localised to the back, devoid of indications of a serious underlying pathology such as malignancy, infection, or cauda equina syndrome), spinal stenosis, radiculopathy, or any other identifiable spinal aetiology (including vertebral compression fracture of ankylosing spondylitis. The diagnosis of non-specific low back pain indicates the absence of a recognised pathoanatomical aetiology.[2] It is characterized by soreness, stiffness, muscle tension, and restricted mobility in the region between the lower ribs and hips, developing into chronic low back pain where symptoms persist beyond twelve weeks. This illness is prevalent across multiple age categories, with its incidence progressively increasing with age. It has become a significant factor in the reduction of global productivity and is a primary cause of disability in many countries worldwide. Individuals with chronic non-specific low back pain may experience a multifaceted range of impairments. Numerous concerns including postponed activation and impairment in the deep multifidus and transverse abdominis muscles in individuals with CNSLBP. It was also found that an elevated vulnerability to fatigue in the respiratory muscles of individuals suffering from low back pain, which therefore compromises the functionality of the core musculature in the lumbar and abdominal regions.[3] CNLBP is intricately associated with psychosocial factors, sensorimotor function, and the central nervous system ‘s capacity to modulate pain. [4] Low back pain is a prevalent public health issue due to its significant incidence. Presently, over 70% of the population endures at least one instance of global low back pain, with over 577 million individuals affected by this condition globally. Between 85% and 95% of individuals lacks a definitive Patho-anatomical aetiology for the pain, individuals with chronic low back pain experiences a significant limitation in daily activities, leading to elevated pain and impairments levels.[5]

Various therapy modalities have been employed to alleviate pain and its related causes in diverge groups with chronic low back pain, yielding inconsistent and limited outcomes. Inefficient conditioned pain-modulated systems and psychological variables may contribute to the occurrence of chronic low back pain. The ideal treatment approach for the conservative management of chronic low back pain remains contentious. Core stability exercises are more efficacious in alleviating pain and enhancing physical function in patients with chronic low back pain in the near term. Furthermore, additional interventions, such as manual therapy (MT), which has been shown to be effective in reducing impairment in people with chronic low back pain. Finally, Kinesio tape (KT), is increasingly utilised in the management of the same diseases, and it appears that when combined with core workouts, KT is typically employed to enhance muscle activation, attributed to the placebo effect steaming from the patient's expectations regarding Kinesio taping.[5] Core stability exercises may yield significant therapeutic benefits for patients with CNSLBP, diminishing pain intensity, functional impairment, and enhancing quality of life, core muscle activation, improving spinal stability, neuromuscular control and reducing shear strain that damages the lumbar spine [6].

METHODOLOGY: -

Research Design- A quasi experimental research design was framed to obtained reliable measures.

Sample Size and Procedure of sample selection-

31 patients of CNSLBP patients were recruited from the OPD of Physiotherapy Department and a tertiary health care centre. All the participants were assigned who were medically diagnosed with CNSLBP, i.e., Kinesio taping 'Y' with core stability exercise. The allocation was made to ensure the outcome was unbiased.

The Patients were provided Informed consent to identify information. The method of sampling was purposive. The G-power software version was used to calculate sample size. The institution's health care research ethics approved the study protocol (HEC Reference No: 2024- June-002), as well as written informed documentation was taken from all patients. The trial was registered with the central trial registry index-CTRI/2024/08/072846.

Eligibility screening –

An allergy test was conducted for all medically diagnosed CNSLBP patients based on inclusion criteria.

Inclusion criteria-

Age between 30-55 years.

Diagnosed with chronic non-specific low back pain (CNSLBP)

Pain score greater than three on the numeric pain rating scale (NPRS)

Outcomes measures-

Numeric pain rating scale is a type of self-reporting form (11 scoring items) primarily used to assess pain intensity[7]

Sample Size Determination:

Sample size was calculated using G-power software with an effect size of 0.50, $\alpha=0.05$, and power $(1-\beta)=0.80$.

Tools and Techniques to Assess the outcomes-

For Sociodemographic Investigation:

Demographic variables, including age, gender, marital status, education level, employment status, and location, were assessed using a biodata form and personally interviewed to the participants.

For Experimental Investigation:

The experimental investigation was conducted with respondents and was implemented in three phases.

1.Phase-1 Pre-test

2. Phase-2- Therapy Administration

3. Phase-3 Post-test

Interventions of patients with CNSLBP for application of therapies-

All selected patients were randomly assigned, where they received treatment for 4 weeks on alternative days (three times in a week), Patients receives Y taping along with core stability exercises such as prone plank, single-leg bridges (right and left), side plank, double bridge and bird dog.[8]

In experiment Y' taping was applied with light tension (15-25%) or paper -off tension for 5 cm. Thus, the tape was released without strain as the patient returned to a neutral posture or moves into the position of forward flexion with rotation to the opposite

side.[9]

Post -test measurements of the patients:

All patients were re-tested using the same pre-test measurements to evaluate improvement after the final session of therapy, with following a four- week treatment intervention course within the selected therapies.

Data Analysis:

The obtained data were analysed using SPSS version26. Descriptive statistics (frequency, percentage, mean, and standard deviation) summarized participant's sociodemographic characteristics demographic characteristics. assessed associations between sociodemographic variables and primary outcomes, 'Wilcoxon' test was applied to compare the pre and post outcomes.

Data Analysis:

The collected data were analysed using SPSS version 26. Descriptive statistics (frequency, percentage, mean, and standard deviation).

Demographic Information:

The mean age of the participants were 45.3 years, The sociodemographic data of the respondents revealed a wide range of variations in terms of region, educational qualification, and occupation.

Table1: Demographic Distribution of the Participants

	N	mean	Std. deviation	95% CI	P-value
weight	31	67.24	9.811	(4.44- 5.24)	.000
age	31	45.29	7.682	(4.44-5.24)	.000
gender	0			(4.44-5.24)	.000
Pre- rest pain	31	4.84	1.098	(4.44-5.24)	.000
Pre- work pain	31	0	7	(4.44-5.24)	.000

Table2: Comparison of pre and post outcomes

S. No	Variable	Median (IQR)	Z-Value	P-Value
1	Pre rest pain	8.0(3.0)	-4.949	.000
2	Post rest pain	6.0(3.0)		
3	Pre working pain	8.0(2.0)	-4.126	.000
4	Post working pain	6.0(2.0)		

The table 2 value represents that the median pain score was significantly reduced from 8.0 to 6.0 at rest and during work which was highly indicating that the treatment is highly effective in reducing pain.

Table 3: Pre pain status while working

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3.2	3.2	3.2
4	5	16.1	16.1	19.4
5	10	32.3	32.3	51.6
6	7	22.6	22.6	74.2
7	8	25.8	25.8	100.0
Total	31	100.0	100.0	

The Table -3 values suggests that prior to intervention, the majority of participants reported moderate – to severe pain during work (mean =5.6, median =5.5), with the largest percentage expressing a pain score of 5 (32.3%), reflecting persistently high pre-treatment pain levels.

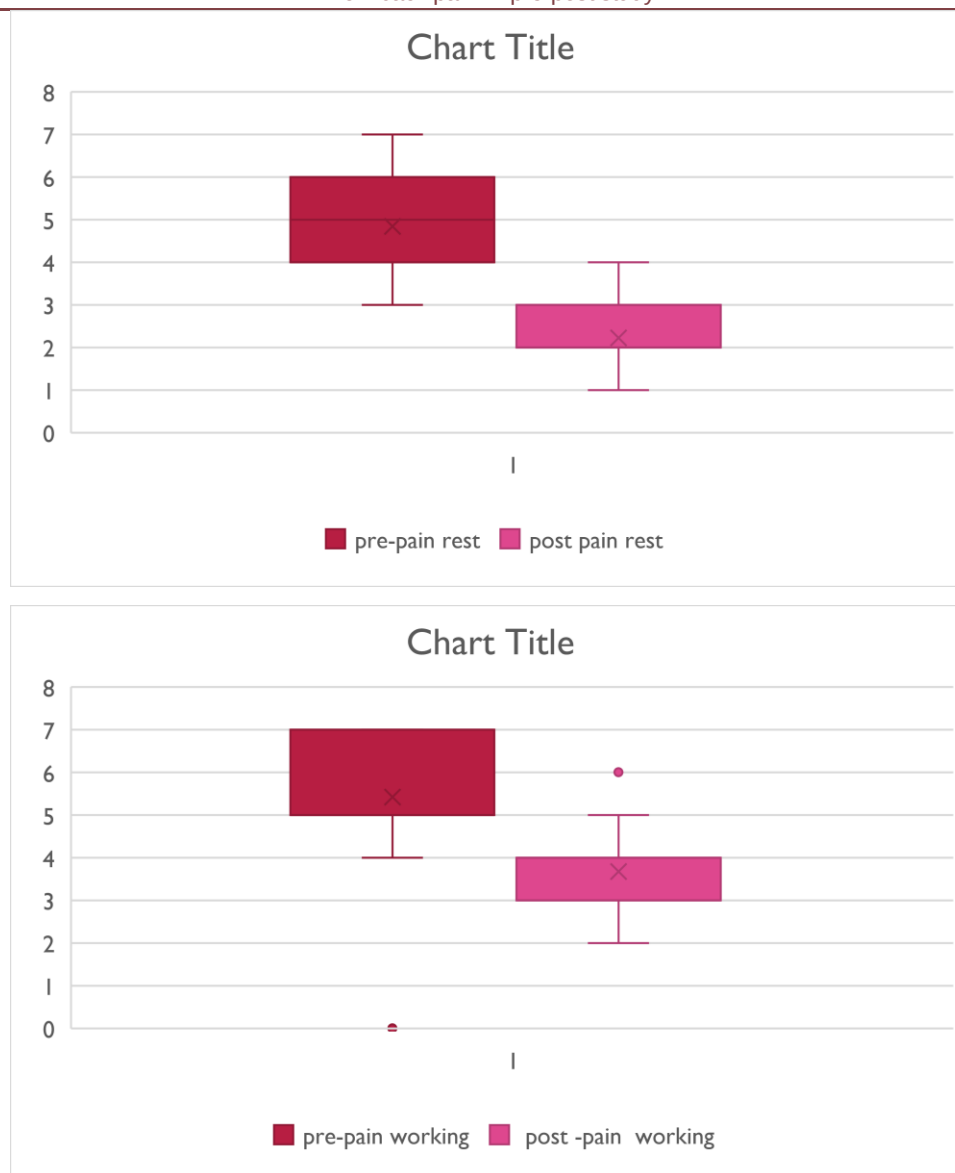
Table-4 : Pre - pain status while resting

	Frequency	Percent	Valid Percent	cumulative percent
Valid 3	4	12.9	12.9	12.9
4	7	22.6	22.6	35.5
5	12	38.7	38.7	74.2
6	6	19.4	19.4	93.5
7	2	6.5	6.5	100.0
Total	31	100.0	100.0	

The table 4 values suggests that before intervention, patients predominantly experienced moderate pain level with resting, while fewer participants reporting either very mild or severe pain. The clustering around the mid -range scores (4-6) indicate a consistent pain.

Table 5: Pain Association in working or resting pattern

Pain type	Pre-mean	Post-mean	Absolute reduction	% reduction
Resting Pain	6.8	3.2	3.6	53%
Work Pain	7.2	4.1	3.1	43%



DISCUSSION: -

The current study shows that among participants with persistent CNSLBP, the intervention considerably decreased pain during rest and during work. In this study it was found that Core stability exercises with 'Y' taping is effective in the management of CNSLBP during rest and working duration. CNSLBP is one of the most common widespread health conditions across the globe, and thus the patients with CNSLBP are more likely to miss their work and be less productive, which also has a major financial impact.[10] There are many studies on the effective treatment for CNSLBP still, there is a lack of evidence for efficient treatment. There are different shapes of Kinesio taping but which shape is more effective in the management of CNSLBP is not yet cleared, basically this study focuses on the effectiveness of 'Y' shaped Kinesio taping along with core stability exercises. KT which is a non-invasive procedure provides afferent stimuli, pain inhibitory processes, it changes the pattern of recruitment of muscle fibres. It was marked significantly that KT provides deep relief, decreases pain, and in improving quality of life.[11]

Taping has been demonstrated that it is highly effective in improving proprioception and preventing injuries by enhancing joint position sense and resisting harmful movements.[12] In one of the studies, it was documented that the active range of motion in lower trunk flexion is enhanced by applying 'Y' shaped Kinesio taping via, to support the low back musculature, promotes tissue healing and prevent restrictions, and leads towards the improvement for better Quality of life.[13]. CSE concentrated on the recruitment of the deep abdominal muscles through the use of pressure biofeedback and abdominal hollowing technique, and is highly effective in the management[14]

In one of study of Li. Pan in 2023 where the systematic review and meta-analysis of nine studies; demonstrated that Kinesio taping provided significant short-term pain relief but showed no superiority in improving disability or trunk function as compared with sham taping, meanwhile the study demonstrated that there was reduction in both pain and disability as likely with the integration of Y-taping with progressive core stability exercises. Thus, this study highlights the added value of combining KT

with targeted rehabilitation strategies for CNSLBP.[15] The other study documented that KT results in modest short-term benefits. Specifically, resultant in temporary enhancements in disability (4-point reduction on Oswestry; 1.2-point reduction on Roland-Morris at 1 week) and pain (mean difference 1 cm on VAS, sustained at 4 weeks). KT also enhanced the endurance of trunk muscles at both the one-week and four-week mark. Nevertheless, these effects were deemed to be insufficiently significant to be clinically significant and deteriorated over time.

The authors determined that KT has the potential to alleviate pain and disability in CNSLBP; whereas, its advantages are restricted in terms of duration and magnitude.[16] Pre-intervention mean pain score was 6.8 ± 1.2 (median 7, IQR 6-8), which dropped to 3.2 ± 1.0 (median 3, IQR 2-4) post intervention. This represents a significant improvement in baseline comfort, with an absolute decrease of 3.6 points (53%). The higher decrease in resting pain might be a result of the intervention's success in reducing baseline inflammation and muscular tension, which enables patients to feel comfortable while they are on the resting position[11] The mean pain score before the intervention was 7.2 ± 1.3 (median 7, IQR 6-8), and after the intervention, it dropped to 4.1 ± 1.1 (median 4, IQR 3-5). This amounts to a 43% decrease in absolute terms, or 3.1 points. The decrease is nonetheless, statistically and clinically significant, while being somewhat less than that seen from resting pain. The slighter improvement can be the result of ongoing discomfort caused by mechanical loading and prolonged postural demands during activity.

The general effectiveness of the treatment was confirmed by the negative Z- values from the Wilcoxon Signed Rank Test via with the resting pain $Z = -4.949$; work pain $Z = 4.126$; both $p < 0.001$, which had shown that post-intervention pain scores were consistently lower than pre-intervention scores. In similar study, it was reported that pain through ODI was significantly reducing taping intervention.[17] In another study, it was found that after the twelve days of intervention, pain intensity and Oswestry disability improved significantly in both the groups, and it was also proved that Kinesio taping provides a substantial improvement in the management of pain and disability.[18]

CONCLUSION: -

Patients with persistent, non-specific low back pain benefits from the intervention in terms of both resting and work-related discomfort. A more significant better result was seen that during rest time; patients were more benefited. Thus, in findings it was also found that work-related patients were also more relaxed, whereas more tactics can be required to maximise alleviation while performing functional tasks.

LIMITATIONS:

Generalisability, there was limited sample size. In future long-term follow-up is required, furthermore many outcomes can be added with better result.

REFERENCES

1. García-de-la-Banda-García R, Cruz-Díaz D, García-Vázquez JF, Martínez-Lentisco M del M, León-Morillas F. Effects of Virtual Reality on Adults Diagnosed with Chronic Non-Specific Low Back Pain: A Systematic Review. *Healthcare (Switzerland)* 2025;13:1328. <https://doi.org/10.3390/HEALTHCARE13111328/S1>.
2. Nicol V, Verdaguer C, Daste C, Bissierex H, Lapeyre É, Lefèvre-Colau MM, et al. Chronic Low Back Pain: A Narrative Review of Recent International Guidelines for Diagnosis and Conservative Treatment. *J Clin Med* 2023;12:1685. <https://doi.org/10.3390/JCM12041685>.
3. Zhang L, Cui S, Xi X, Bi H, Pu Y, Huang B. Efficacy and safety of dynamic neuromuscular stabilisation in treating chronic non-specific low back pain: a systematic review and meta-analysis protocol. *BMJ Open* 2025;15:87036. <https://doi.org/10.1136/bmjopen-2024-087036>.
4. Lou T, Chen Q, Tian M. Comparative efficacy of non-pharmacological interventions on kinesiophobia in patients with chronic non-specific low back pain: a study protocol for a systematic review and network meta-analysis. *BMJ Open* 2025;15:e096099. <https://doi.org/10.1136/BMJOPEN-2024-096099>.
5. Blanco-Giménez P, Vicente-Mampel J, Gargallo P, Baraja-Vegas L, Bautista JJ, Ros-Bernal F, et al. Clinical relevance of combined treatment with exercise in patients with chronic low back pain: a randomized controlled trial. *Sci Rep* 2024;14:17042. <https://doi.org/10.1038/S41598-024-68192-2>.
6. Frizziero A, Pellizzon G, Vittadini F, Bigliardi D, Costantino C. Efficacy of core stability in non-specific chronic low back pain. *J Funct Morphol Kinesiol* 2021;6. <https://doi.org/10.3390/JFMK6020037>.
7. Nugent SM, Lovejoy TI, Shull S, Dobscha SK, Morasco BJ. Associations of Pain Numeric Rating Scale Scores Collected during Usual Care with Research Administered Patient Reported Pain Outcomes. *Pain Medicine: The Official Journal of the American Academy of Pain Medicine* 2021;22:2235. <https://doi.org/10.1093/PM/PNAB110>.
8. Wang H, Fan Z, Liu X, Zheng J, Zhang S, Zhang S, et al. Effect of Progressive Postural Control Exercise Versus Core Stability Exercise in Young Adults with Chronic Low Back Pain: A Randomized Controlled Trial. *Pain Ther* 2023;12:293–308. <https://doi.org/10.1007/S40122-022-00458-X>.
9. Liu K, Yin L, Ma Z, Yu B, Ma Y, Huang L. Effect of Different Kinesio Taping Interventions on the Local Thresholds of Current Perception and Pressure Pain in Healthy Adults. *Front Physiol* 2020;11:596159. <https://doi.org/10.3389/FPHYS.2020.596159>.
10. Alarab A, Salhab I, Darawy D, Abu Aker M, Al Naji R, Hroub N. Maitland Mobilization versus Core Stability Exercises in Management Chronic Nonspecific LBP. *Biomedical and Pharmacology Journal* 2024;17:1115–24. <https://doi.org/10.13005/BPJ/2927>.

11. Uzunkulaoglu A, Aytekin MG, Ay S, Ergin S. The effectiveness of Kinesio taping on pain and clinical features in chronic non-specific low back pain: A randomized controlled clinical trial. *Turk J Phys Med Rehabil* 2018;64:126. <https://doi.org/10.5606/TFTRD.2018.1896>.
12. Ghai S, Ghai I, Narciss S. Influence of taping on joint proprioception: a systematic review with between and within group meta-analysis. *BMC Musculoskelet Disord* 2024;25:480. <https://doi.org/10.1186/S12891-024-07571-2>.
13. Yoshida A, Kahanov L. The Effect of Kinesio Taping on Lower Trunk Range of Motions. *Research in Sports Medicine* 2007;15:103–12. <https://doi.org/10.1080/15438620701405206>.
14. Smrcina Z, Woelfel S, Burcal C. A Systematic Review of the Effectiveness of Core Stability Exercises in Patients with Non-Specific Low Back Pain. *Int J Sports Phys Ther* 2022;17:766. <https://doi.org/10.26603/001C.37251>.
15. Alternative Therapies In Health And Medicine - A Peer-Reviewed Journal n.d. <https://alternative-therapies.com/oa/index.html?fid=7918> (accessed October 2, 2025).
16. Castro-Sánchez AM, Lara-Palomo IC, Matarán- Peñarocha GA, Fernández-Sánchez M, Sánchez-Labraca N, Arroyo-Morales M. Kinesio Taping reduces disability and pain slightly in chronic non-specific low back pain: a randomised trial. *J Physiother* 2012;58:89–95. [https://doi.org/10.1016/S1836-9553\(12\)70088-7](https://doi.org/10.1016/S1836-9553(12)70088-7).
17. Toprak Celenay S, Ozer Kaya D. Immediate effects of kinesio taping on pain and postural stability in patients with chronic low back pain. *J Bodyw Mov Ther* 2019;23:206–10. <https://doi.org/10.1016/J.JBMT.2017.12.010>.
18. Kelle B, Güzel R, Sakallı H. The effect of Kinesio taping application for acute non-specific low back pain: a randomized controlled clinical trial. *Clin Rehabil* 2016;30:997–1003. <https://doi.org/10.1177/0269215515603218>.