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## A comparison of Kinesiotaping versus coordinating training exercises in non-specific subacute lowback pain & disability

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### Abstract

**Background:** Various studies have determined the effect of strengthening exercises, spinal mobilization and hamstring stretching on Non-specific low back pain (NSLBP). However comparison between the effect of Kinesiotaping and coordination exercises has not been reported so far.

**Objective:** To study the effectiveness of Kinesiotaping in patients with NSLBP.

**Study design:** Experimental study.

**Methodology:** 60 patients having Subacute NSLBP (female, male) fulfilling the inclusion and exclusion criteria were recruited and were randomly allocated in two groups. Group A subjects were treated with application of Kinesiotape in X shape on Centre point of pain and group B subjects were given with co-ordination exercises. Pain and functional ability were depicted by using VAS scale and Roland Morris (RM) Disability score respectively.

**Data analysis:** Data Analysis was done by using SPSS version 15.0.

**Result:** Significant changes were seen between & within both groups for VAS and functional ability.

**Conclusion:** Study proves that Kinesiotaping has significant effect in the management of Sub-acute NSLBP.

**Keywords:** Sub-acute NSLBP, Kinesiotaping, co-ordination exercises

### Introduction

Low back pain (LBP) is the fifth most common reason for physician visits, which affects nearly 60-80% of people throughout their lifetime <sup>[1]</sup>. Lifetime prevalence of low back pain is reported to be as high as 84%, and the prevalence of chronic low back pain is about 23%, with 11-12% of the population being disabled by low back pain <sup>[2]</sup>.

Non-specific low back pain (NSLBP) accounts for over 90% of patients presenting to primary care <sup>[3]</sup>. Non-specific (or Simple or Mechanical) low back pain is the general term that refers to any type of back pain in the lumbar region that is not related to serious pathology and/or does not have a specific cause. Non-specific low back pain can be caused by Traumatic injury, Lumbar sprain or strain or Postural strain. It can be secondary to conditions such as: Spondylolysis and Spondylolisthesis, Disc Herniation, Spinal stenosis, Osteoporosis with Compression fracture (Lumbar compression fracture) or any Congenital disease such as Kyphosis and Scoliosis <sup>[4]</sup>.

Symptoms of NSLBP vary with the nature of physical activities <sup>[5]</sup>. However, NSLBP manifests as pain, muscle tension, or stiffness that is localized below the costal margin and above the inferior gluteal folds and is not attributed to a specific pathology with or without leg pain involvement <sup>[6]</sup>.

LBP is considered to be a largely self-limiting health problem <sup>[7]</sup>. It is estimated that 80 to 90% of patients with acute LBP disorders recover within six weeks <sup>[8]</sup>. However, 10 to 20% will develop chronic LBP (CLBP) <sup>[9]</sup>. Approximately 70 to 80% of health care and social costs are attributed to the 10 to 20% of patients with CLBP. Once LBP becomes chronic, it can be a significant source of long-term disability and absence from work and consequently represents a high socioeconomic burden on health-care systems in developed countries <sup>[10]</sup>.

Chronic low back pain is commonly associated with sleep problems, including a greater amount of time needed to fall asleep, disturbances during sleep, a shorter duration of sleep, and

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less satisfaction with sleep. In addition, a majority of those with chronic low back pain show symptoms of depression or anxiety. As the structure of the back is complex and the reporting of pain is subjective and affected by social factors, the diagnosis of low back pain is not straightforward [11].

Commonly prescribed treatments for NSLBP such as acupuncture, traction, TENS, facet injections, laser therapy, massage, therapeutic ultrasound, spinal mobilization and lumbar supports have little or no evidence to support their use. None of the commonly used interventions can truly offer a solution to the problem of NSLBP. In most patients, reductions in the number of CLBP-related complaints are minimal while pain continues unabated [12].

A new approach for the treatment of NSLBP is to support the affected area, relax the muscles, and reduces pain sensation and is referred to as Kinesio taping (KT). Extensive literature searches revealed limited evidence where Kinesio taping has been compared with co-ordination exercise for the management of NSLBP. Therefore, this study aimed to compare the efficacy of Kinesio Taping and co-ordination on pain and functional disability in subjects with Sub acute NSLBP.

**Material and Methodology**

**Study design:** Experimental study

**Study setting:** T.D.T.R D.A.V Institute of Physiotherapy and Rehabilitation, Yamuna Nagar

**Sampling method:** Non- randomized sampling

**Samples size:** 60 subjects

**Inclusion criteria**

- Age between 18-25 years.
- Sub acute low back pain. (i.e. between 6 to 12 weeks)
- No analgesics and no anti-inflammatory drugs were taken 3 days before the visit.
- Both males and females
- Not engaged in regular back exercises program for minimum of 3 months.

**Exclusion criteria**

- Serious spinal pathologies (fractures, tumors and inflammatory pathologies such as ankylosing spondylitis) or osteoporosis.
- Nerve root compression (disc herniation and spondylolisthesis and neurological compromise, spinal stenosis and others.
- Serious cardio respiratory diseases.
- Pregnancy
- Cortico steroid treatment in the previous 2 weeks.
- Central or peripheral nervous system disease.

**Procedure**

Subjects fulfilled the inclusion and exclusion criteria were included in the study by taking their written consent and were conveniently divided into two groups.

**Group A- Kinesio taping Group**

In this group, Kinesiotaping was applied to the center pain point using X shaped after cleaning the treatment area with cotton to improve the tape adherence. Subjects were remain taped for 7 consecutive days.



**Group 1:** Group A Kinesiotaping was applied to the center pain point using X shaped after cleaning the treatment area with cotton to improve the tape adherence.



**Group 2:** Group B Coordination Exercises group the co-ordination exercise protocol was

- In standing position, the subjects touched the knee with the elbow of contralateral side.
- In quadruped position, elevate the arm and leg of contralateral sides to place them in line with the trunk.
- Spice crook lined with knee flexed and feet on the floor. Sit up exercise with rotation of the back.
- Proprioceptive training on the balance board.

The exercises were alternatively performed for both the sides with 20 repetitions per day for 7 days.

**Outcome measures**

The outcome measures of pain and disability were taken using

Visual analogue Scale (VAS) and Roland Morris (RM) Disability score respectively at baseline (i.e. on 1<sup>st</sup> day before treatment intervention) and on 8<sup>th</sup> day.

**Data analysis and result**

Data was analyzed using the software SPSS-15.0. Unpaired & Paired T- was applied to compare the outcomes between & within the groups. Study found that both the variance i.e. Pain and RM score have significantly improved in both the group. However experimental group have shown significant improvement in both variance as compare to the control group.

**Table 1:** Comparison within the group of Pre and Post-test of Roland and Morris Disability Questionnaire

Paired test			Mean	S.D.	Mean Difference	Paired T Test	P value	Table Value at 0.05	Result
Roland & Morris Disability Questionnaire	Group A	Pre-Test	7.13	2.763	4.30	7.223	<0.001	2.05	Significant
		Post-Test	2.83	2.214					
	Group B	Pre-Test	8.20	3.809	4.07	9.045	<0.001	2.05	Significant
		Post-Test	4.13	1.978					

**Table 2:** Comparison within the group of Pre and Post-test of Visual Analog Scale

Paired test			Mean	S.D.	Mean Difference	Paired T Test	P value	Table Value at 0.05	Result
Visual Analog Scale	Group A	Pre-Test	5.67	1.241	3.67	15.503	<0.001	2.05	Significant
		Post-Test	2.00	1.174					
	Group B	Pre-Test	5.73	1.741	1.83	7.487	<0.001	2.05	Significant
		Post-Test	3.90	1.348					

**Table 3:** Comparison between the Groups of Roland and Morris Disability Questionnaire

Unpaired T Test			Mean	S.D.	Mean Difference	Unpaired T Test	P value	Table Value at 0.05	Result
POST Readings Comparison	Roland & Morris Disability Questionnaire	Group A	2.83	2.214	1.300	2.398	0.0197	2.00	Significant
		Group B	4.13	1.978					

**Table 4:** Comparison between the Groups of Visual Analog Scale

Unpaired T Test			Mean	S.D.	Mean Difference	Unpaired T Test	P value	Table Value at 0.05	Result
POST Readings Comparison	Visual Analog Scale	Group A	2.00	1.174	1.900	5.821	<0.001	2.00	Significant
		Group B	3.90	1.348					

## Discussion

### Improvement in Pain intensity (VAS)

Kinesiotaping is found to be significantly more effective in reducing pain intensity. The results are in accordance with the findings M. Paolini, *et al.* (2011) who reported significant pain reduction in patients with CLBP <sup>[12]</sup>. This could be explained as the inhibition of pain perception occurs due to the stimulation of the mechanoreceptor caused by the mechanical displacement of the adhesive tape that occurs due to body movement. Stimulation of these large pressure and touch nerve fibers, thus overrides the small pain nerve fibers and causing decreased perception of pain (Gate-Control Theory) <sup>[13]</sup>.

It is also believed that Kinesio tape lifts the upper layers of skin, creates more space between the skin and underlying muscles that helps to reduce pressure on the lymph channels and create more space for circulation, flow and improve lymph drainage through the taped area that may assist in decrease swelling and pain in injured areas.

### Improvement in functional ability

The functional ability is significantly improved in Kinesiotaping group. This could be explained as the unique elastic properties of Kinesiotape provide additional anatomical support to the muscles and joints during activities, provide continuous corrective proprioception from the involved area that discourages harmful movements whilst still allowing a safe and healthy range of motion. Along with this the reduction of edema, inflammation and joint and muscular pain also assist in the improvement in the functional ability of the subject. Kinesiotaping also restore the balance by improving the proprioception and influencing the muscle tone. Different applications of kinesiology tape can also be used to improve joint alignment and can improve the function of a joint influencing opposing muscle groups and joint mobility <sup>[14]</sup>.

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