


EFFECTS OF KINESIO-TAPING VS DRY NEEDLING IN THE MANAGEMENT OF MECHANICAL LOW BACK PAIN


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ABSTRACT

Background of the study: Mechanical pain of musculoskeletal origin, known as nonspecific LBP (NSLBP), has symptoms that change depending on the type of physical activity [1]. About 85% of her LBP patients present in primary care settings are NSLBP patients.

Methodology: Randomized control trial (RCT) conducted between January 2020 and October, 2021, Rawal General and Dental Hospital and Al-Nafees, the hospital in Islamabad. Thirty patients were included in the study. Two participants were discontinued. There were two groups of patients i.e., 15 patients in the KT group and 13 patients in the DN group diagnosed of NSCLBP by orthopedic surgeon and referral to outpatient physiotherapy clinic. The Sample size was calculated using the OpenEpi scale. The Consent form was filled out by the participants before the initiation of the study. Pain Rating Scale, Roland-Morris Disability Index Questionnaire (RMDQ) and

Global patient rating scale (PGR) were assessed at baseline, two weeks post-intervention and four weeks post-treatment.

Results: Before treatment, there were no differences between the groups for PNRs, RMDQ and PGR. Both DN and KT produced significant improvements in all baseline measures (PNRS, RMDQ and PGR) after two weeks and four weeks of treatment ($p < 0.05$). Considerable improvements were observed in all variables in both groups after treatment. However, Statistical analysis ANOVA showed no significant differences in almost all measures between groups. ($p > 0.05$).

Conclusion: Kinesio-taping is as effective as DN in managing back pain. When treating back pain, adding DN or KT to your exercise program can make a significant contribution to your treatment.

Keywords: Dry needling, athletic tape, low back pain, disability evaluation, analogue pain scale, physical therapy specialty.

Introduction

Mechanical pain of musculoskeletal origin, known as nonspecific LBP (NSLBP), has symptoms that change depending on the type of physical activity¹. About 85% of her LBP patients present in primary care settings are NSLBP patients². Nonspecific lower back pain syndrome (NSLBP) is characterized by pain, muscle tightness, or stiffness under the rib arches and in the folds under

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the buttocks, with or without leg pain^{3,4}. LBP is primarily considered a physical disability⁵. It is believed that 80-90% of patients with acute LBP recover completely within 6 weeks^{6,8}. However, 10–20% of people experience chronic LBP^{7,9,10}. 10-20% of patients with CLBP are responsible for approximately 70–80% of health and social costs^{7,11,15}. Chronic low back pain places a significant socioeconomic burden on healthcare systems in developed nations and is a major contributor to long-term disability and absenteeism^{16,13,17}. One of the most common reasons people go to doctor is non-specific chronic low back pain (NSCLBP), which limits activity in people under the age of 45 in developed countries¹⁷. The main objectives of conservative management of LBP are to teach patients how to manage their pain, lessen pain, and improve activities of daily living (ADLs)⁸. Kinesio Tape is made to resemble the characteristics of the skin. The stretchability of the tape is intended to resemble the elasticity of the skin closely, and its thickness is comparable to that of skin. During three to five days, the tape is still remains on the skin and works. You can wear the elastic strands since the cotton fibers allow quick drying and evaporation¹⁸. When used correctly, the connective area can be used to relax weak muscles and relax overworked muscles. The application of the tape varies according to specific goals, such as improving active range of motion, relieving pain, regulating deformity, or improving lymphatic circulation¹⁸. Kinesio taping (KT) is a conservative therapy for pain control in treating musculoskeletal disorders that has recently gained popularity. The K-Tape technique has two concepts with different tensions when applied. Light (15-25%) pulling of the attachment-to-muscle method inhibited muscle function, while mild-to-moderate (25-50%) stretching of the attachment-to-muscle attachment method inhibited muscle function, and muscle function was impaired. Attachment points, muscle function, is activated^{18,19}. For the treatment of musculoskeletal pain, including LBP, dry needling (DN), a relatively new method used by doctors around the world, is widespread and receiving attention^{20,21}. Direct insertion of acupuncture needles into the fascial trigger points is a minimally invasive procedure^{20,22}. It was done to check for trigger points, either latent or active. The study team not using local anaesthesia. We selected these muscles for a variety of reasons. Active Trigger Points are a common occurrence in the gluteus medius, quadratus lumborum, and deeper multifidus, which is one of the underlying stabilizing factors but is also a significant source of pain. Patients with multifidus and erector spinae were placed face down while the gluteus medius and quadratus lumborum tests were conducted on them while they were in the lateral decubitus position. The multifidus, quadratus lumborum, and gluteus medius were positioned at a 90° angle, and the erector spinae were placed at a 45° angle. After identifying the trigger points, the skin was washed with alcohol and pierced with a needle. The injection method described by Travel and Simons for TP was used with fine 0.25–0.40 mm and 0.30–0.60 mm stainless steel needles²³. Keep the needle in place for 20 minutes. After 10 minutes, rotate the needle to stimulate again. Six treatment sessions were performed twice a week. A physical therapist (SG) licensed in dry acupuncture at TP administered the antidote²⁴.

Rationale of the Study

The present study aimed was to determine the effect of kinesio-taping vs dry needling in the treatment of chronic nonspecific low back pain (NSCLBP).

Methodology

Study Design

The Randomized clinical trial. Randomization was done by the lottery method. The Non-probability convenient sampling technique was used. The study was single-blinded (Assessor blinded).

Total Sample Size

The study included 30 participants with back pain. Two patients were discontinued. The sample was calculated by the OpenEpi tool software. The Sample size was (n1): 15 patients in the conventional group (KT group) and (n2):13 participants in the interventional group (DN group).

Duration

Between January 2020 and October 2021.

Setting

The data was collected from Rawal General and Dental Hospital and Al-Nafees Hospital in Islamabad.

Data Collection Tool

Questionnaires provide subjective ratings for patients and objective measures for clinicians. Data collection was performed using a wide range of demographics, the Roland Morris Disability Index questionnaire to measure the rate of improvement in disability after treatment, and a numerical pain rating scale to measure pain.

Data Analysis

Data were analyzed using SPSS 20. After evaluation, independent tests, repeated measures, Chi-square tests and analysis of variance (RMANOVA) were used to analyze the data. Both qualitative and quantitative variables underwent frequency and percentage analysis. Quantitative variables underwent mean and standard deviation analysis. Chi-square tests were used to investigate the connection between disability and various variables.

Inclusion Criteria

Aged 18 to 75 years had mechanical low back pain lasting >2 months, potential trigger points in the lumbar paraspinal muscles, the tight palpable band with palpable nodules in muscles indicating the reduced range of motion and pain.

Exclusion Criteria

Participants suffering from any of the contraindications to Kinesio-tape or needle phobia, Pregnancy and parturition, any psychological disorder, acute or chronic radiating LBP resulting from fracture or instability.

Data Collection Procedure

Each participant underwent a pre-intervention evaluation before being randomly assigned to either the dry needling with physiotherapy intervention group or the kinesio taping group, and outcome measurements were taken before the intervention, that is, baseline assessment. After the intervention of two weeks and the four weeks of treatment. After treatment, patients were assessed post-interventionally. For KT participants, all the inspections were performed two weeks after KT removal. Kinesio bandages and dry needling were applied as additional treatment during the procedure. In the conventional group (KT group) uses Kinesio taping and the interventional group (DN group) used dry needling with conventional physicaltherapy. Exercises include Stretching and strengthening your back and abdominal muscles. Over four weeks, the participant completed three sets of counselling exercises, consisting of 30-second holds and a 30-second three-fold break for each stage. A set of strength training (10 repetitions of 5 seconds rest) was performed 3 times a week for more than 4 weeks. Following a pre-intervention evaluation, each participant was randomly assigned to receive kinesio taping or dry needling as part of a physical therapy intervention. The outcomes were recorded through baseline evaluation before intervention, two weeks into intervention, and four weeks into treatment. Patients were evaluated post-intervention after receiving treatment. All assessments for the KT participant were completed two weeks after the KT was removed. Participants were divided into two groups the KT group (Conventional physical therapy treatment with kinesio taping and the DN group (conventional physical therapy treatment with dry needling were given. There was a 12-session treatment schedule that lasted for

four weeks. Three sessions were held each week. For four weeks, both groups received intervention sessions three times a week. During 4 weeks, 3 recommended training sets including 30 second hold and 3 30 second rest were performed. A set of strength training (10 repetitions of 5 seconds) is performed 3 times a week for more than 4 weeks.

Results

This study comprised 28 patients. The patients were assessed pre, mid and post-treatment through the Roland-Morris questionnaire, Numeric pain rating Scale and Patient Global Rating Scalet to observe the improvement after physical therapy sessions. The patients in both groups were similar in terms of the sessions they underwent and outcome measures of baseline values.

Table 1: Demographic Data

The demographic data was collected on the self-made questionnaire, which includes the data about the distribution of age, gender, height, weight and body mass index.

Group Statistics			
	Groups Of Study	Mean ± Std. Deviation	P-Value
Age(Years)	KT Group	39.60±13.69	0.6
	DN Group	37.15±12.54	
Height Of Population(Cm)	Kt Group	1.64±0.14	0.8
	DN Group	1.63±0.15	
Weight Of Population(Kg)	Kt Group	67.60±12.82	0.6
	DN Group	69.92±11.05	
Body Mass Index	Kt Group	27.15±6.70	0.8
	DN Group	27.52±5.13	

Table 1: Demographic Data

Group Statistics			
	Groups Of Study	Mean± Std. Deviation	P-Value
Roland-Morris Questionnaire Score At Baseline Assessment	Kt Group	13.06±3.78	0.84
	DN Group	12.76±4.28	
Roland-Morris Questionnaire Score At 2Week Assessment	KT Group	8.53±3.66	0.87
	DN Group	8.30±3.83	
Roland-Morris Questionnaire Score At 4Week Assessment	KT Group	3.60±2.16	0.76
	DN group	3.84±2.15	

Table 2: Roland-Morris Questionnaire

The table shows that the mean Roland-Morris questionnaire score at baseline was 13.06 ± 3.78 in the KT group compared to 12.76 ± 4.28 (p-value 0.84) in the DN group. Moreover, his mean Roland-Morris questionnaire score at 2 weeks in the KT group was 8.53 ± 3.69 , whereas in the DN group it was 8.30 ± 3.83 (p-value 0.87). Similarly, at the 4-week assessment, his KT group mean was 3.60 ± 2.16 , whereas in DN group it was 3.84 ± 2.15 with (p-value 0.76). The means of the two groups did not statistically differ.

	Groups Of Study	Mean± Std. Deviation	P-Value
Percentage Categories Of Roland-Morris Questionnaire	KT Group	72.28±14.91	0.556
	DN Group	68.85±15.51	

Percentage categories of Roland-Morris

This table shows that in the KT group the mean of Percentage categories of Roland-Morris

questionnaire score was 72.28 ± 14.91 whereas in DN group it was 68.85 ± 15.51 . The means of the two groups did not differ statistically (p-value, 0.556).

Group Statistics			
	Groups Of Study	Mean± Std. Deviation	P-Value
Pain Numeric Rating Scale At Baseline Assessment	ScaleKT group	7.29±0.98	0.57
	DN group	7.51±1.09	
Pain Numeric Rating Scale Score At 2 Week Assessment	KT group	5.50±1.59	0.43
	DN group	4.98±1.84	
Pain Numeric Rating Scale At 4 Week Assessment	ScaleKT group	2.55±1.27	0.82
	DN group	2.44±1.35	

Table 3: Pain Numeric Rating Scale

According to this table, the mean Pain Numeric Rating scale score at baseline assessment for the KT group was 7.29 ± 0.98 , while it was 7.51 ± 1.09 for the DN group with a (p-value of 0.57). In addition, the mean Pain Numeric Rating scale score in the KT group at the 2-week assessment was 5.50 ± 1.59 while it was 4.98 ± 1.84 in the DN group with a (p-value of 0.43). Similar to this, the mean at 4 weeks was 2.55 ± 1.27 for the KT group and 2.44 ± 1.35 for the DN group with a (p-value of 0.82). The means of the two groups did not statistically differ.

	Groups Of Study	Mean± Std. Deviation	P-Value
Average score of Pain Numeric Rating Score	KT group	5.11±1.03	0.728
	DN group	4.98±1.00	

Average score of Pain Numeric Rating score

This table shows that in the KT group the mean of Average score of Pain Numeric Rating score was 5.11 ± 1.03 whereas in DN group it was 4.98 ± 1.00 . The means of the two groups did not statistically differ from one another (p-value, 0.72).

Measure	Mean ± Standard. Deviation	P-Value
Pre-score	13.06±3.78	0.001
Mid-score	8.53±3.66	
Mid-score	8.53±3.66	0.001
Final-score	3.60±2.16	0.001
Pre-score	13.06±3.78	
Final-score	3.60±2.16	

Table 4: Roland-Morris Questionnaire within the Group Comparison (Kt Group)

The table shows that in the KT group the mean pre-point score was 13.06 ± 3.78 compared to the midpoint score which was 8.53 ± 3.66 . A statistically significant difference exists between the preliminary and average means ($P < 0.001$). Similarly, comparing a median of 8.53 ± 3.66 with a mean final score of 3.60 ± 2.16 , there is a significant difference between mean and final scores ($P < 0.001$). Additionally, the comparison of mean pre-score and endpoint score was 13.06 ± 3.78 and 3.60 ± 2.16 respectively, between the pre-final score mean and the final score mean, there was a significant difference ($P < 0.001$).

Measure	Mean± Standard. Deviation	P-Value
Pre-score	12.76±4.28	0.00
Mid-score	8.30±3.83	
Mid-score	8.30±3.83	0.00
Final-score	3.84±2.15	
Pre-score	12.76±4.28	0.00
Final-score	3.84±2.15	

Roland-Morris Questionnaire within the Group Comparison (Dn Group)

The table shows that in the DN group the mean pre-point score was 12.76 ± 4.28 compared to the midpoint score which was 8.30 ± 3.83 . A statistically significant difference exists between the preliminary and average means ($P < 0.001$). Similarly, comparing a median of 8.30 ± 3.83 with a mean final score of 3.84 ± 2.15 , there is a significant difference between mean and final scores ($P < 0.001$). Furthermore, the comparison of mean prescore and endpoint score was 12.76 ± 4.28 and 3.84 ± 2.15 respectively, a statistically significant difference between the mean of the pre- and post-test scores was discovered. ($P < 0.001$)

Measures	Mean ± Standard Deviation	P-Value
Pre-score	7.29±0.98	0.001
Mid-score	5.50±1.59	
Mid-score	5.50±1.59	0.000
Final-score	2.55±1.27	
Pre-score	7.29±0.98	0.000
Final-score	2.55±1.27	

Table 5: Pain Numeric Rating Scale within the Group Comparison (Kt Group)

The table shows that the mean pre-point score was 7.29 ± 0.98 in the KT group compared to the midpoint score, which was 5.50 ± 1.59 . A statistically significant difference exists between the preliminary and average means ($P < 0.001$). Similarly, comparing a mean value of 5.50 ± 1.59 with a mean final score of 2.55 ± 1.27 , there is a significant difference between mean and final scores ($P < 0.001$). Additionally, comparison of mean pre-score and finish-points The score was 7.29 ± 0.98 and 2.55 ± 1.27 respectively, between the pre-final score mean and the final score mean, there was a significant difference ($P < 0.001$).

Measures	Mean ± Standard. Deviation	P-Value
Pre-score	7.51±1.09	0.004
Mid-score	4.98±1.84	
Mid-score	4.98±1.84	0.000
Final-score	2.44±1.35	
Pre-score	7.51±1.09	0.000
Final-score	2.44±1.35	

Pain Numeric Rating Scale within the Group Comparison (Dn Group)

The table shows that the DN group had a mean pre-assessment of 7.51 ± 1.09 compared to a mean of 4.98 ± 1.84 . A statistically significant difference exists between the preliminary and average means ($P < 0.004$). Similarly, comparing a mean value of 4.98 ± 1.84 with a mean final score of 2.44 ± 1.35 , difference between the mean and final scores is statistically significant ($P < 0.001$). Additionally, a significant difference between the mean pre-score and final score was discovered when comparing their respective means, which were 7.51 ± 1.09 and 2.44 ± 1.35 , respectively ($P < 0.001$).

Discussion

The aim of this study was to compare physical therapy exercise interventions with the kinesio taping and the dry needling in the treatment of CLBP based on changes in clinical outcomes (pain, disability). In our study, combining DN and KT with postural and stretching

exercises was effective in relieving pain and reducing disability compared to baseline. There was no significant difference. Improved function may result from pain relief, and continued substantial improvement may be associated with enhanced muscle tone and elasticity after treatment. González-Iglesias et al²⁵ observed significant improvements in pain and ROM in whiplash patients in the KT group compared to the placebo KT group. We also found that KT, like others, can positively affect pain, disability, and ROM. Using KT may have produced positive patient responses, reduced exercise anxiety, and improved ROM. This is because KT traction lifts the epidermis, relieving pressure on mechanoreceptors under the skin and reducing nociceptive stimulation. Ligament tension also provides compatibility, including pain preventive measures, thus lowering pain levels²⁵. Recent research was conducted by Paoloni et al. We conducted a study to look at how exercise and her KT combined affected pain and ADL in a CLBP patient²⁶. Our LBP reduction findings were in line with Paoloni et al.'s. Her pain was significantly reduced after four weeks of combined exercise therapy and KT, as determined by a pain scale. In contrast to Paoloni et al.'s study, the KT group showed a significant decline in disability as determined by the RMDQ. The shorter grades in our study (34.8 years) compared to Paoloni et al.'s study (62 years old) may cause the decrease in disability²⁶. We came to the conclusion that the results of the Roland-Morris Disability Questionnaire were significant by contrasting our research with earlier studies. A study where the Roland-Morris Disability Questionnaire significantly decreased in both groups on day five compared to baseline (all $P < 0.001$). We found no discernible differences between the two groups regarding pain and disability related to ADL and trunk ROM extension and flexion. Both patient groups saw similar reductions in pain and disability, even though both groups improved more. Highly recommended for those with chronic low back pain to consider DN application at TP as a crucial form of therapy. Kalichman and Vulfsons endorsed DN²⁷. This because the treatment is affordable, simple to learn, low-risk, and minimally invasive. DNs are valid following the initial consultation. A program of 5 or 6 sessions held every two days typically allows for observing symptom development²⁷. Analyses of pain's nature and frequency have been conducted and reduced clinical efficacy, TPs, and TP sensitivity. The fact that there was no overlap in the confidence intervals for pain intensity, pain quality, number of TPs, or TP sensitivity supports our conclusion. This study's pre- and post-treatment phases show that DN appears to be more successful in reducing pain and disability; there was no statistically significant difference among the post-treatment groups. The 95% confidence intervals overlap and no difference was found. In a study by Tllez-Garca et al DN and DN combined with neuroscience training were contrasted²⁸. In their study, the authors only engaged the gluteus medius and quadratus lumborum's active TP through DN. Although our study's application method differs from that of other studies, the impact of DN on pain and disability was comparable. The improvement in pain with the DN application and, or the absence of pain-induced fear of exercise may be to blame for the decrease in pain and disability.

CONCLUSION

Kinesiotaping is an effective method as DN in treating mechanical back pain. During the management of Mechanical back pain, the addition of DN or KT to the exercise program can make substantial contributions to the treatment.

AUTHORS' CONTRIBUTION:

The following authors have made substantial contributions to the manuscript as under:

Conception or Design: Adeela Asad

Acquisition, Analysis or Interpretation of Data: Adeela Asad, Sidra Kouser, Muhammad Ammar, Sarah kafeel

Manuscript Writing & Approval: Adeela Asad

All authors acknowledge their accountability for all facets of the research, ensuring that any concerns regarding the accuracy or integrity of the work are duly investigated and resolved.

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