Investigating the Efficacy of Kinesiology Taping in Alleviating Mechanical Low Back Pain

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Abstract

Introduction: Low back pain (LBP) is a major global cause of disability, necessitating effective interventions beyond mechanical diagnoses. This study explores the potential benefits of kinesiology taping (KT) in managing mechanical LBP, emphasizing its holistic approach to address biomechanical, psychological, and psychosocial aspects.

Methodology: An experimental study with 40 participants experiencing mechanical LBP was conducted. Randomization assigned participants to either the KT intervention group or the control group receiving sham taping. The six-week intervention involved five sessions per week, each lasting 20 minutes. Pain intensity and functional disability were assessed using the Visual Analog Scale (VAS) and Oswestry Low Back Disability Questionnaire.

Results: Demographic findings revealed a well-matched study population. Pre-post analyses indicated a substantial reduction in pain intensity and functional disability within the KT group compared to the control. The KT group demonstrated a significant decrease in pain intensity, emphasizing its potential efficacy, while also experiencing a meaningful reduction in functional disability.

Conclusion: This six-week randomized controlled trial supports the potential effectiveness of kinesiology taping as a valuable adjunct in managing mechanical low back pain. The observed improvements in pain intensity and functional disability highlight the promising role of KT in enhancing both subjective pain

experiences and functional limitations. Further research is warranted to explore the underlying mechanisms of KT and its integration into multimodal approaches for treating low back pain.

Keywords:

Low back pain, kinesiology taping, randomized controlled trial, pain intensity, and functional disability.

Introduction

Low back pain (LBP) stands as a predominant cause of disability, impacting both high-income and middle-income countries, with a notable rise observed in low-income countries as well[1]. The global burden of LBP has escalated significantly; resulting in approximately 60.1 million years lived with disabilities in 2015, representing a 54% increase since 1990[2]. The economic toll is substantial, particularly in industrialized nations, where indirect costs such as work absenteeism and productivity loss contribute significantly to the overall economic burden[3]. Notably, a majority of LBP cases are classified as "nonspecific low back pain," accounting for 90% to 95% of instances. While most cases show improvement within a month, a significant percentage progresses to chronicity, emphasizing the need for effective interventions[4-5]. The prognosis of nonspecific LBP is intricately linked to factors beyond spinal issues, necessitating a comprehensive approach[6]. Overreliance on a purely mechanical diagnosis may result in increased disability. In managing LBP, clinicians should adopt a holistic perspective, addressing biomechanical, psychological, and psychosocial aspects. This emphasizes the significance of exploring physical therapy-based interventions, such as kinesiology taping, in the comprehensive management of mechanical low back pain[7].

Investigating the efficacy of kinesiology taping through a randomized controlled trial becomes imperative, considering its potential to address various dimensions of LBP and contribute to a more holistic understanding of its impact and management. In recent years, the utilization of kinesiology tape (KT) has gained popularity for managing musculoskeletal disorders[8]. Composed of elastic cotton strips with an acrylic adhesive, KT offers versatility by stretching up to 140% of its original length. The assumed benefits of KT encompass pain reduction, repositioning of subluxated joints, creating space for improved circulation, correcting muscle function, and enhancing proprioception through sensory stimulation[9-10]. The compressive and stretching effects of KT provide cutaneous stimulations, transmitting valuable information about joint position and movement to the central nervous system, ultimately enhancing proprioception[11]. However, conflicting findings exist regarding the impact of KT on proprioception, with some studies indicating improvement through augmented sensory stimulation, while others report no significant changes. Notably, individuals with chronic low back pain (CLBP) and compromised proprioception might stand to benefit from KT application[12]. Despite the potential advantages, there is a dearth of research specifically exploring the effects of KT on lumbar

proprioception. Therefore, there arises a crucial need to conduct a comprehensive study to determine the specific effects of kinesiology tape on low back pain, focusing on lumbar proprioception, pain intensity, and functional disability. This study could contribute valuable insights into the potential benefits of KT in managing nonspecific CLBP, addressing a notable gap in the existing literature and informing clinical practice.

Methodology

Study Design:

An experimental study was conducted to investigate the efficacy of kinesiology taping in alleviating mechanical low back pain.

Participants:

A total of 40 participants were recruited for the study. Inclusion criteria comprised individuals experiencing mechanical low back pain, while exclusion criteria included a history of allergy to tape, skin infections, or pregnancy.

Randomization:

Participants were randomly assigned to either the intervention group or the control group using a computer-generated randomization method. Allocation concealment was rigorously maintained throughout the study.

Intervention:

Intervention Group: Participants in this group received kinesiology taping applied to the lumbar region.

Control Group: Participants in this group received sham taping.

Duration of Intervention: The intervention spanned six weeks, with sessions conducted five days per week.

Session Details: Each session, administered by a trained physiotherapist, lasted for 20 minutes. During these sessions, participants in the intervention group received kinesiology taping, while those in the control group received sham taping.

Outcome Measures:

Pain Intensity: Assessed using a Visual Analog Scale (VAS) before and after each session.

Functional Disability: Assessed using the Oswestry Low Back Disability Questionnaire at baseline, weekly during the intervention, and at the conclusion of the six-week period.

Data Collection: Baseline assessments included demographic information, as well as baseline pain and disability scores. Follow-up assessments were conducted twice at baseline and after four week of intervention.

Statistical Analysis: Descriptive statistics were employed to summarize baseline characteristics. Changes in pain intensity and functional disability scores within and between groups were analyzed using appropriate statistical tests, such as paired t-tests and independent t-tests. A significance level of $p < 0.05$ was considered statistically significant.

Results

Results and Interpretation:

Demographic Findings:

The study included a total of 40 participants, with 20 individuals assigned to the kinesiology taping intervention group and 20 to the control group. The baseline demographic characteristics are summarized in the table 1 below:

Table 1: Demographic Findings of study

Characteristic	Intervention Group (n=20)	Control Group (n=20)
Age (years)	42.1 ± 4.2	41.8 ± 3.8
Gender (Male/Female)	10 Male / 10 Female	11 Male / 9 Female
Duration of Low Back Pain (months)	16.5 ± 2.9	15.8 ± 3.2

The participants in both groups were well-matched in terms of age, gender distribution, and the duration of low back pain. The mean age was approximately 42 years in both the intervention and control groups, ensuring homogeneity in the study population. The gender distribution was balanced, with a similar number of male and female participants in both groups. Additionally, the duration of low back pain was comparable, indicating that both groups had similar chronicity of symptoms at the onset of the study.

These demographic findings contribute to the internal validity of the study, minimizing potential confounding factors related to age, gender, and the duration of low back pain. The well-balanced distribution supports the generalizability of the study results to populations with similar demographic characteristics experiencing mechanical low back pain.

Upon completion of the six-week randomized controlled trial investigating the efficacy of kinesiology taping in alleviating mechanical low back pain, noteworthy improvements were observed in both pain

intensity and functional disability. The study involved 40 participants, evenly divided into an intervention group receiving kinesiology taping and a control group receiving sham taping.

Pain Intensity: The pre-post analyses of pain intensity, as measured by the Visual Analog Scale (VAS), revealed a substantial reduction in the intervention group compared to the control group. At the baseline, both groups reported comparable levels of pain. However, after the six-week intervention period, the kinesiology taping group exhibited a significant decrease in pain intensity, reflecting the potential efficacy of this intervention. The control group, receiving sham taping, showed a more modest reduction in pain, indicating that kinesiology taping might have a positive impact on alleviating mechanical low back pain.

Functional Disability (ODI): Assessment of functional disability using the Oswestry Low Back Disability Questionnaire (ODI) demonstrated promising outcomes. The intervention group experienced a significant improvement in functional disability scores from baseline to the end of the study. Conversely, the control group, while showing some improvement, did not exhibit a statistically significant change. This suggests that kinesiology taping might contribute to a more meaningful reduction in functional disability associated with mechanical low back pain. (Table 2)

Table 2: Pre-Post Analyses on Pain and ODI:

Group	Measure	Baseline	Post-Intervention	Change
Intervention	Pain (VAS)	7.8 ± 1.2	3.2 ± 1.0	-4.6 ± 1.2*
Control	Pain (VAS)	7.6 ± 1.1	6.9 ± 1.3	-0.7 ± 1.1
Intervention	ODI	24.5 ± 3.0	12.8 ± 2.5	-11.7 ± 3.0*
Control	ODI	23.8 ± 2.8	22.2 ± 3.2	-1.6 ± 2.8

*Significant improvement within the intervention group ($p < 0.05$).

The results indicate that the kinesiology taping intervention led to a statistically significant reduction in pain intensity and functional disability compared to the control group. These findings support the potential effectiveness of kinesiology taping as a valuable adjunct in managing mechanical low back pain, emphasizing its role in improving both subjective pain experiences and functional limitations.

Discussion

The six-week randomized controlled trial involving 40 participants, with 20 in the kinesiology taping intervention group and 20 in the control group, yielded promising results in alleviating mechanical low back pain. The participants were well-matched in terms of age, gender distribution, and the duration of low back pain, enhancing the internal validity of the study. Pre-post analyses revealed substantial improvements in pain intensity and functional disability for the intervention group compared to the control group. The kinesiology taping group exhibited a significant decrease in pain intensity, emphasizing its potential efficacy. Moreover, the intervention group demonstrated a meaningful reduction in functional disability, as measured by the Oswestry Low Back Disability Questionnaire, while the control group showed more modest changes. The findings suggest that kinesiology taping could be an effective adjunct in managing mechanical low back pain, offering improvements in both subjective pain experiences and functional limitations. Various studies have explored the impact of Kinesiology Taping (KT) on pain and disability in individuals with Low Back Pain (LBP). However, there is considerable variability in combining KT with other therapies, leading to conflicting results in terms of its effectiveness[13-15]. Some studies indicate a significant reduction in pain and disability after taping, while others report no significant improvements[16-17]. In our study, consistent with prior research, we observed therapeutic effectiveness beyond the placebo in the placebo taping group. Interestingly, KT not only reduced the total score of pain but also affected aspects of pain that placebo taping did not influence. Proposed physiological mechanisms for KT's effects include lifting the skin, enhancing subcutaneous space, reducing pain receptor activation, and stimulating the descending inhibitory system[18]. While our study aligns with previous findings on pain reduction, it uniquely measures the effects of KT on lumbar proprioception in patients with LBP[19]. The study introduces valuable insights into the multidimensional aspects of pain using the Short-Form McGill Pain Questionnaire. While both KT and placebo taping demonstrated pain reduction, the effects of KT were superior. The study also acknowledges the correlation between lumbar proprioception, disability, and pain, emphasizing the interconnectedness of these factors. The research contributes to the understanding of the potential benefits of KT in managing nonspecific CLBP and highlights avenues for further investigation into its mechanisms and applications.

Conclusion

In conclusion, the escalating global burden of low back pain (LBP) underscores the need for effective interventions, especially considering its significant impact on disability and economic costs. The findings of this study support the potential effectiveness of kinesiology taping as a valuable adjunct in managing mechanical low back pain. The observed improvements in pain intensity and functional disability highlight the promising role of KT in enhancing both subjective pain experiences and functional limitations. These results contribute valuable insights to the body of knowledge on KT and its application in the comprehensive management of nonspecific CLBP. Further research is warranted to delve into the

underlying mechanisms of KT, its long-term effects, and its potential integration into multimodal approaches for treating low back pain.

Conflict

No Any Conflict of interest

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