

## Original Research

# *Effectiveness of Kinesiotaping in Reducing Low Back Pain among Elderly Individuals*

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### ABSTRACT

**Background** Low Back Pain (LBP) is a musculoskeletal disorder characterized by discomfort in the lower back region, sometimes accompanied by radiating pain to the lower extremities. LBP is common in individuals aged over 35 years due to degenerative changes such as tissue damage and decreased intervertebral fluid, which reduce spinal and muscular stability. In elderly populations (>60 years), reduced muscle strength exacerbates LBP symptoms, significantly impairing daily function. Kinesiotaping is a physiotherapy technique used to improve musculoskeletal function and support natural healing, including in cases of LBP.

**Objective** This study aimed to determine the effectiveness of kinesiotaping in reducing LBP symptoms among elderly individuals.

**Methods** A quantitative descriptive approach with a one-group pretest–posttest design was employed. The study was conducted at Car Free Day (CFD) Colomadu, Karanganyar Regency, Central Java, in July 2024. A total of 40 elderly participants were recruited. Data were collected using the Keele Start Back Screening Tool questionnaire.

**Results** Among the 40 elderly participants (62.5% female), most experienced LBP classified as minimal disability (50.0%). Post-intervention assessments showed improvements in pain scores, suggesting a positive effect of kinesiotaping on LBP symptoms.

**Conclusion** Kinesiotaping appears to be an effective intervention for reducing low back pain in elderly individuals, particularly in those with minimal functional disability.

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## INTRODUCTION

Globally in 2020 Low Back Pain affected 619 million people, the number of cases could continue to increase to >800 million people in 2050 due to population growth and aging (Ferreira et al., 2023). About 80% of all people have experienced LBP at least once in their life. Women often experience LBP due to excessive physical activity, injury, muscle tension, spinal disorders, obesity, pregnant women, poor posture (Abbafati et al., 2020). The incidence of LBP according to WHO (2022) if the musk disorder the number of musculoskeletal disorders in the world is 1.71 billion, while the incidence of LBP is the 3rd health problem in the world, including Osteoarthritis totaling 528 million people in 2022, Rheumatism totaling 335 million people in 2020 and LBP totaling 17.3 million people in 2022 (Putra et al., 2022). Central Java Province, the prevalence of LBP from DINKES data (2018) amounted to 314,492 people. It is estimated that 40% of the population of Central Java aged 20-65 years suffer from LBP with a prevalence of 18.2% in men and 13.6% in women.

LBP is a clinical syndrome characterized by the onset of pain symptoms around the lower back which may or may not spread to the lower legs (Putri et al., 2021). LBP is a musculoskeletal disorder caused by poor body activity, which is accompanied by symptoms of weakness or stiffness in the lower back muscles (Cashin et al., 2021).

Risk factors for the emergence of LBP complaints include chemical hazards (from liquids, solids, dust, smoke, vapors and gases), physical hazards (noise, vibration, inadequate lighting, radiation, and extreme temperatures), biological hazards (bacteria, viruses, infectious waste, and infestations), psychological hazards (stress and tension), hazards related to the non-application of ergonomic principles (poorly designed machines, mechanical devices and equipment used by workers, inappropriate seating or poorly designed work practices) (Bhagawati, 2015).

Pain is a complaint of more than one sensation caused by a certain stimulus. The intensity of pain varies from mild, moderate, and severe pain (Price, 2014). The definition of pain in the medical dictionary is a feeling of pressure, pain, discomfort caused by certain nerve stimuli. Pain is primarily protective, and acts as a warning signal to the body against damaged tissue, prompting a person to reduce or eliminate the cause of the pain (Velasco-Roldán et al., 2018). LBP pain occurs due to decreased strength and endurance of the abdominal muscles and gluteus maximus muscles as well as muscle tension in the iliopsoas muscles and erector spine muscles (Pristianto et al., 2022).

Method Kinesio Taping is a physiotherapy modality to correct and improve musculoskeletal system disorders with a natural healing process that can relieve LBP pain complaints (Umami & Hartanti, Ragil Ismi, 2014). KT works by lifting the layers of skin, creating space between the skin and muscle which can reduce pressure on nerves and blood vessels, increasing circulation and lymphatic drainage which cant activates nerve and muscle performance when performing functional movements, reduces pain, reduces swelling, reduces inflammation, and supports muscle and joint function, reduces muscle tone that experiences excessive tension, facilitates movement

due to stretching so that movement is more assisted and efficient (Abdurrasyid et al., 2014).

In LBP patients, KT can reduce pain and disability, improve circulation, increase muscle tone, and reduce pain, as well as being a safe method with minimal side effects (Abbasi et al., 2020). The use of KT attached to the skin or injured muscle area can increase muscle strength, relieve spasms, reduce pain, reduce edema, improve blood circulation and lymph reflux, and stabilize joints and improve LGS (Sheng et al., 2019). Clinically, KT can increase muscle bioelectrical ability using electromyography (EMG) after 24 hours of installation, and its function can decrease after 4 days of use (Abdurrasyid et al., 2014).

Based on a field survey of the Elderly at CFD Colomadu, Karanganyar Regency - Central Java in July 2024, by providing the Keele Start Back Screening Tool questionnaire during the health check, it was found that many elderly people complained of lower back pain. Based on the preliminary study, the researcher was interested in conducting a study entitled "Effectiveness of Kinesiotaping in Reducing Lower Back Pain in the Elderly".

## MATERIALS AND METHODS

This research design uses a pre-experimental method through a one group pretest-posttest control group approach. Before becoming a respondent, the researcher explains the intent and purpose of the study. After the respondent understands the intent and purpose of the study, the respondent signs the consent form. So that the population in this study were the elderly who were present at CFD Colomadu, Karanganyar Regency and underwent the examination who experienced LBP complaints as many as 75 people. The sample in this study were patients who complained of pain at CFD Colomadu as many as 40 people who were taken using a simple random sampling technique by setting inclusion and exclusion criteria. The inclusion criteria in this study were: 1) Respondents complained of lower back pain with a VAS pain score of at least 2, 2) Respondents were cooperative, 3) Respondents with or without painkillers, 4) Willing to follow and complete the intervention during the pretest-posttest until finished and, 5) willing to sign the informed consent/person representing. Meanwhile, the exclusion criteria are elderly people with the following conditions: 1) Infection in the area where the plaster will be applied, 2) Open wounds in the area where the plaster will be applied, 3) Active bleeding, 4) Malignancy in the area where the plaster will be applied, 5) Severe allergies or irritated skin, and 6) Deep Vein Thrombosis (DVT).

Independent variables; kinesiotaping and dependent variables; pain reduction and LBP incidence. The instrument used in this study was the Visual Analog Scale (VAS) application to measure the pain scale, namely a tool with a line of 0-10 cm, a VAS value of 0 indicates no pain, a VAS value of 1-3 indicates mild pain, a VAS value of 4-6 indicates moderate pain, and a VAS value of 7-10 indicates severe pain. Patients were instructed to mark the point that corresponds to the level of pain intensity felt on a scale of 1-10, while the Keele Start Back Screening Tool (SBST) to identify LBP risk

factors was a questionnaire consisting of 9 questions that would assess the psychosocial aspects of back pain. The score results from this questionnaire will group patients into low, moderate, or high risk categories. If the resulting score is 3 or less, then the patient is at low risk for chronic low back pain. The intervention given was KT Double I strip from insertion to the origin of the lumbar erector muscle with a 25% pull on the lower back area between the 12 costal bones of the gluteus fold which was carried out for 3 days. Data analysis was carried out in several stages, namely the pre-analysis stage, initial assessment, initial action, principle analysis, and interpretative stage. The statistical test used was the paired t-test for the difference test before and after the intervention, and the linear regression test was used to test the effect of kinesiotaping on the intervention group.

## RESULTS

### Percentage by Age and Gender.

The results of the study on respondent characteristics and data analysis are presented in **Table 1**. The subjects of this study numbered 40 people, most of whom were >60 years old and female.

**Table 1.** Age and Gender of Elderly with LBP in CFD Colomadu

Category	Frequency	Percentage (%)
<b>Age</b>		
Age <60 years	60	60
Age >60 years	40	40
<b>Gender</b>		
Woman	25	62.5
Man	15	37.5
<b>Total</b>	40	100

Based on table 1, it shows that the age category according to elderly respondents who experience LBP in the elderly is mostly aged >60 years, which is 40 people (40%), while those aged <60 years are 60 people (60%). Based on gender category, the majority are women, which is 25 people (62.5%), while those who are male are 15 people (37.5%).

### Percentage of LBP based on Keele Initial Screening Tool values

**Table 2.** Incidence of LBP in the Elderly at CFD Colomadu

Category	Frequency	Percentage (%)
Minimal Disability	20	50
Moderate Disability	15	37.5
Severe Disability	5	12.5
Very Severe Disability	0	0
<b>Total</b>	40	100

Based on table 2, it can be seen that the category of LBP incidents for respondents with disabilities was the most, namely 20 people (50%), the category of moderate disabilities was 15 people (37.5%), the category of severe disabilities was 5 people (12.5%), and the category of very severe disabilities was 0 people (0%).

## Percentage of lower back pain based on VAS values

**Table 3.** LBP measurement using VAS

Category	Pre-test (N)	Percentage (%)	Post-test (N)	Percentage (%)
No pain	0	0.0	15	18.8
Mild pain	20	25.0	10	12.5
Moderate pain	15	18.8	13	16.3
Severe pain	5	6.3	2	2.5
<b>Total</b>	<b>40</b>	<b>50.0</b>	<b>40</b>	<b>50.0</b>

Based on table 3, VAS measurements on LBP respondents stated that the Pretest value of respondents had no pain 0 people (0%), mild pain 20 people (25%), moderate pain 15 people (18.8%), severe pain 5 people (6.3%). While the Posttest Value of respondents had no pain 15 people (18.8%), mild pain 10 people (12.5%), moderate pain 13 people (16.3%), severe pain 2 people (2.5%).

### Results of the paired t-test statistical test

Based on statistical tests using paired t-test, the results obtained if the Pretest has a mean value of 4.25 from 40 people, SD value of 1.808 with a standard error of 0.286. while the Posttest has a mean value of 2.65 from 40 people, SD value of 2.466 with a standard error of 0.390. Based on the significance value (2-tailed) of the results above is  $<0.001$  ( $p < 0.05$ ). So it can be concluded that the use of KT can reduce pain in LBP sufferers in the elderly. The KT method for joint problems works by improving alignment due to muscle spasm and shortening, normalizing muscle tone and joint fascia abnormalities, increasing ROM and reducing pain through activation of the nervous system and blood circulation. The KT method comes from kinesiology and is used in various conditions because of its ability to reduce pain, reduce inflammation, relax muscles, improve performance and facilitate temporary rehabilitation that supports muscles in movement (Murtafiah et al., 2022).

## DISCUSSION

### Age of elderly respondents at CFD Colomadu

The results of this study were obtained if the distribution of respondents based on age, the majority were  $>60$  years old, namely 40 respondents (40%), while those aged  $<60$  years were 60 respondents (60%). In this study, the age included in the elderly category  $>60$  years and experiencing LBP in the disability category was at least 20 respondents, moderate disability was 15 respondents, severe disability was 5 respondents and very severe disability was 0 respondents.

The cause of LBP complaints usually occurs at the age of  $>35$  years, the older the level of complaints will increase because bone density begins to experience degeneration such as tissue damage, decreased fluid levels causing decreased bone and

muscle stability. Tired muscles can cause reduced flexibility in the spine, so that lumbar mobility during forward flexion and lateral bending affects the health and function of the spine. Excessive or limited lumbar flexion, as well as lack of flexibility in lateral bending, can cause LBP and other functional problems (Pristianto et al., 2022).

The occurrence of degeneration in the human body begins with tissue damage, replacement of tissue with scar tissue, and reduced fluid when someone starts entering the age of 30 years causing decreased bone and muscle stability which can be one of the triggering factors for the onset of LBP symptoms. The prevalence of lower back pain is divided into two categories, namely low 84% with pain intensity  $<5$ , while high 16% with pain intensity  $>5$  (Junita et al., 2021).

According to research (Muzammilia Naraini et al., 2024) if the majority of elderly LBP patients treated at Sinjai Regional Hospital amounted to 52 people (aged 60-75 years) caused by female gender, housewife work, radiating and acute pain accompanied by HNP, and experiencing impaired body function. The nature of the intervertebral disc can change with age, because the disc is composed of fibrocartilage with a gelatinous matrix and the disc will become dense and irregular fibrocartilage so that disc degeneration occurs which causes lower back pain (Diba & Bahri, 2018).

According to (Saputra, 2020) Age is one of the factors influencing the occurrence of LBP in workers due to unstable body positions, muscle tension, movements that are often done suddenly, often experiencing complaints of lower back pain at the age of  $>35$  years there are 21 workers (58.33%) while those aged  $<35$  years do not experience LBP because that age is the cause of lower back pain. According to (Nadifatuzzahroh et al., 2024) if as much as 69.6% of LBP occurs at the age of  $\geq 45$  years and as much as 89.1% of LBP occurs due to work experience of  $\geq 5$  years. This is influenced by increasing age, namely 30 years, because there is a change in tissue into scar tissue and fluid decreases so that bone and muscle stability decreases, the older a person is, the higher the risk of experiencing decreased bone elasticity which is a trigger for LBP (Harwanti et al., 2018).

So researchers concluded that as age increases, a person can cause disorders that occur in lower back pain such as reduced muscle stability, muscle tension. This study found that elderly people  $>60$  years in CFD Colomadu experienced LBP with a total of 40 respondents (40%) with a minimum disability category of 20 respondents, moderate disability 15 respondents, severe disability 5 respondents and very severe disability 0 respondents.

### **Gender of Elderly Respondents at CFD Colomadu**

Results This study found that the distribution of respondents based on gender was predominantly female, namely 25 people (62.5%) with the number of LBP incident categories, while men numbered 15 people (37.5%) with the LBP incident category. According to (Sinaga & Makkiyyah, 2021), the majority LBP respondents were female aged 50-60 years. Most respondents had a smoking habit, rarely did physical exercise, mild pain intensity and did not interfere with daily activities. Women had a 2.05-fold risk of experiencing low back pain, while respondents with a smoking habit had a 2.23-

fold risk of experiencing low back pain and respondents who sat more than 4 hours while working had a 1.91-fold risk of experiencing low back pain.

The application of ergonomics can prevent physiological disorders, mental stress, lack of alertness, fatigue and errors so that productivity will increase and be well maintained. So that ergonomics is related to optimization, comfort, health, human safety in carrying out work in the workplace. Activities such as carrying, pushing, lifting and pulling will cause quite a large force on the lower spine (5th lumbar vertebra and 1st sacrum) (Oktaviani et al., 2024).

So the researcher can conclude that the gender of the elderly in CFD Colomadu is mostly female because they are more at risk of experiencing LBP than men, because women often experience menstrual complaints every month when working, sitting too long while working which causes muscles to become stiff and causes continuous tension after coming home from work doing housework so that women's muscle ability is lower than men. The results of the study of the elderly in CFD Colomadu showed that the female gender was 25 respondents (62.5%) while the male gender was 15 respondents (37.5%).

#### **Incidence of Lower Back Pain in Elderly Respondents at CFD Colomadu**

The results of this study were obtained if the distribution of respondents based on the occurrence of LBP in the elderly in CFD Colomadu who participated in the health examination, namely by using the Keele Start Back Screening Tool questionnaire measuring instrument with a minimum disability category of 20 respondents (50%), moderate disability category of 15 respondents (37.5%). Severe disability category of 5 respondents (12.5%). Very severe disability of 0 respondents (0%). LBP incidents often occur due to frequent lifting of heavy objects, non-ergonomic positions while working and positions reaching for goods or objects can cause several LBP complaints (Putri et al., 2021).

According to Syukkur (Et.al, 2022), if there is a difference in pre-post pain after being given kinesiotaping in the intervention group (p-value <0.05) using a paired sample t-test, and there is a difference in pain between the intervention group and the control group (p-value <0.05) using an independent t-test. So that the management of LBP pain in the elderly is not recommended using long-term pharmacological therapy. Alternative non-pharmacological therapy that can use the kinesiotaping method. According to (Analauw et al., 2018) there was a significant decrease in pain (p<0.0001) and a significant increase in functional ability (p<0.0001) after being given the KT method for 12 days which was assessed on the 12th and 30th days. So that KT can reduce pain and increase functional ability in LBP sufferers. So the conclusion of the study is that the incidence of LBP in the elderly is most common in the minimal disability category, which is 20 respondents (50%) because most of the elderly are still able to move actively and exercise diligently.

## CONCLUSION

Based on the objectives and results of the study above, it can be concluded that; the characteristics of respondents according to the age of the elderly who participated in CFD in Colomadu and participated in the health examination were aged >60 years, totaling 40 people (40%), with the highest incidence of LBP in the disability category, namely at least 20 people (50%). The characteristics of respondents according to gender category were mostly women, namely 25 people (62.5%), while men were 15 people (37.5%). The provision of KT can reduce pain in elderly LBP patients, with an actual pain value before the intervention of  $1.808 \pm 0.286$  and after the intervention a value of  $2.466 \pm 0.390$  with an average difference of  $0.658 \pm 0.104$ .

## CONFESSION

Suggestion, For further researchers: it is expected to continue research on interventions or efforts that can reduce the incidence of LBP that are appropriate and effective to be given to the elderly with a diagnosis of LBP, and this research can be used as a basis or theoretical foundation for further research to be conducted. For the Elderly: The researcher hopes that after conducting research and obtaining the results of the description of the incidence of LBP and identifying the characteristics of respondents such as age, gender, it is hoped that the Elderly in CFD Colomadu who have undergone health checks can apply KT to reduce the incidence of LBP.

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