

Effectiveness of kinesiostapping on reducing LBP pain in the elderly

Abstract

Background: LBP is a clinical syndrome characterized by the onset of pain symptoms around the lower back that are without or can be accompanied by lower leg radiance. LBP complaint factors usually occur at the age of 35 years, because bone compaction begins to experience degeneration such as tissue damage, decreased fluid levels cause bone and muscle stability to decrease. Muscle strength will decrease when the age is >60 years. The Kinesiotaping method is a physiotherapy modality to correct and improve musculoskeletal disorders with a natural healing process, one of which can relieve LBP pain complaints. LBP pain greatly interferes with daily activities.

Method: The research method uses quantitative descriptive. Research design with one group pretest-posttest design. The location of the study was carried out at CFD Colomadu, Karanganyar Regency - Central Java in July 2024. The study population was 40 respondents. Data collection techniques in the form of questionnaire instruments Keele Start Back Screening Tool.

Results: Respondent characteristics based on the age of the elderly who participated in CFD in Colomadu and participated in the health examination were aged >60 years totaling 40 people (40.0%), with the most LBP incidents in the minimal disability category totaling 20 people (50.0%). Respondent characteristics based on the gender category in the elderly CFD in Colomadu and participated in the health examination were mostly women totaling 25 people (62.5%), while men totaling 15 people (37.5%).

Conclusion: The majority of LBP incidents were minimal disabilities.

Keywords: low back pain, pain, elderly, kinesiostapping

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Introduction

Globally in 2020 Low Back Pain affected 619 million people, the number of cases could continue to increase to more than 800 million people by 2050 due to population expansion and aging.¹ About 80% of all people have experienced lower back pain at least once in their lives. Women often experience LBP due to excessive physical activity, injury, muscle tension, spinal disorders, obesity, pregnant women, poor posture.²

The incidence of LBP according to WHO³ that musculoskeletal disorders in the world amount to 1.71 billion, while the incidence of LBP is the 3rd health problem in the world including Osteoarthritis amounting to 528 million people in 2022, Rheumatism amounting to 335 million people in 2020 and LBP amounting to 17.3 million people in 2022.⁴ 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% for men and 13.6% for women.

LBP is a clinical syndrome characterized by the onset of pain symptoms around the lower back that are without or can be accompanied by spreading to the lower legs.⁵ LBP is a musculoskeletal disorder caused by poor body activities, which are accompanied by symptoms of weakness or stiffness in the lower back muscles.⁶ Risk factors for LBP complaints include individual factors (length of service, age, gender, BMI, physical fitness and smoking habits), factors at work (length of service, work attitude, workload and length of service) and environmental factors (noise and vibration).⁷

Pain is a complaint of more than one sensation caused by a particular stimulus. The intensity of pain varies from mild, moderate,

and severe pain.⁸ The definition of pain in the medical dictionary is a feeling of distress, 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 by Rosdahl.

The Kinesio Taping method is a physiotherapy modality to correct and improve musculoskeletal disorders with a natural healing process, one of which can relieve LBP pain complaints.⁹ The way KT works with elastic stretching or pulling that stimulates the neuromuscular system in activating nerve and muscle performance when performing functional movements, reducing muscle tone that experiences excessive tension, and facilitating a movement due to pulling or stretching so that movement is more assisted and efficient, so that it will provide a sense of comfort and reduce pain.¹⁰

According to Hammami¹¹ if the patient after being given kinesiostapping on the lower back pain can be reduced. According to Gak Hwang¹² and Kaya¹³ if the use of kinesiostapping with a pull of 15-25% for 3 days can reduce muscle pain. Clinically, KT can increase the bioelectric ability of muscles using electromyography (EMG) after 24 hours of installation, and its function can decrease after 4 days of use.¹⁰

Based on a field survey Elderly people during Car Free Day in Colomadu, Karanganyar Regency - Central Java in July 2024, by providing a questionnaire Keele Start Back Screening Tool during the Health Examination showed 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 Kinesiostapping on Reducing LBP 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 respondents understand the intent and purpose of the study, the respondents sign the consent form. So that the population in this study is the elderly who are present at CFD Colomadu who experience 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 are: 1) Respondents complain of lower back pain with a VAS pain score of at least 2, 2) Respondents are cooperative, 3) Respondents with or without pain medication, 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; kinesiostaping 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 which is 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 they felt on a scale of 1-10, while the Keele Start Back Screening Tool (SBST) to identify risk factors for LBP in the form of a questionnaire consisting of 9 questions that will 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 below, then the patient is at low risk for chronic low back pain. The intervention given was KT Double I strip from insertion to origin of lumbar erector spine muscle with 25% pull in the lower back area between costal bone 12 gluteal folds which was done for 3 days. Data analysis was conducted in several stages, namely preanalysis phase, preliminary assessment, preliminary action, principal analysis, interpretative phase. The statistical test used was paired t-test for different test before and after intervention, and linear regression test used to test the effect of kinesiostaping on the intervention group.

Results

Percentage by age and gender

The results of the study of 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. Based on table 1, it shows that the age category according to elderly respondents who experienced LBP in the Elderly at CFD Colomadu was mostly aged >60 years, amounting to 40 people (40%), while those aged <60 years amounted to 60 people (60%). Based on the gender category, the majority were women amounting to 25 people (62.5%), while those who were men amounted to 15 people (37.5%).

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

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

LBP percentage based on Keele Start Back Screening Tool values

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

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
Total	40	100,

Percentage of lower back pain based on VAS values

Based on Table 3, the VAS measurement on LBP respondents stated that the Pretest value for 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 for 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%).

Table 3 LBP measurement using VAS

Category	Pretest (N)	Percentage (%)	Posttest (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%
Total	40	50.0%	40	50.0%

Paired t-test statistical test results

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 abnormalities of the fascia of the joints, 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.¹⁴

Discussion

Age of elderly respondents on CFD in Colomadu

The results of this study were obtained if the distribution of respondents based on age in elderly respondents at CFD in Colomadu, the majority were aged >60 years, there were 40 respondents or 40%, while those aged <60 years were 60 respondents or 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 15 respondents, severe disability 5 respondents and very severe disability 0 respondents.

The cause of LBP complaints usually occurs at age >35 years, the older the level of complaints will increase because bone density begins to experience degeneration such as tissue damage, decreased fluid levels cause bone and muscle stability to decrease. Muscle strength will decrease when aged >60 years.¹⁵ The occurrence of degeneration of the human body begins with tissue damage, tissue replacement with scar tissue, and fluid reduction when someone starts to enter the age of 30 which can cause bone and muscle stability to decrease. If humans get older, the risk level of decreased bone elasticity will decrease which can be one of the triggering factors for LBP symptoms.¹⁶

According to Safei¹⁷ that most elderly patients with LBP at Sinjai Regional Hospital are 52 patients aged 60-75 years, which is caused by female gender, house wife work, radiating and acute pain, disturbing pain, accompanied by HNP, and experiencing impaired body function. The nature of the intervertebral disc can change with increasing age in adulthood, because the disc is composed of fibrocartilage with a gelatinous matrix and the disc will become dense and irregular fibrocartilage so that disc degeneration causes lower back pain.¹⁸

According to Saputra 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 experience complaints of lower back pain in adults aged >35 years there are 21 workers or 58.33% while those aged <35 years do not experience LBP because that age is the cause of lower back pain. According to Nadifatuzzahroh¹⁹ that as much as 69.6% of LBP occurs at the age of ≥45 years and as much as 89.1% of LBP occurs due to work period ≥5 years. This is influenced by the increasing age of 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 elasticity in the bones which triggers LBP.²⁰

So the researcher concluded that as a person gets older, it will cause disorders that occur in lower back pain or LBP such as reduced muscle stability, muscle tension. This study found that elderly people >60 years old at the Colomadu Elderly Posyandu experienced LBP with a total of 40 respondents or 40% with a minimum disability category of 20 respondents, moderate disability 15 respondents, severe disability 5 respondents and very severe disability there were 0 respondents.

Gender of elderly respondents on CFD in Colomadu

The results of this study were obtained if the distribution of respondents based on gender in elderly respondents on CFD in

Colomadu was predominantly female, totaling 25 elderly with a percentage of 62.5% with the number of LBP incident categories, while males totaled 15 elderly with a percentage of 37.5% with the LBP incident category. According to Sinaga,²¹ the majority of LBP respondents were female aged 50-60 years. Most respondents have a smoking habit and a routine of rarely doing physical exercise, mild pain intensity and does not interfere with daily activities. Females have a 2.05-fold risk of experiencing lower back pain, while respondents with a smoking habit have a 2.23-fold risk of experiencing lower back pain and respondents who sit for more than 4 hours while working have a 1.91-fold risk of experiencing lower back pain.

The application of ergonomics can prevent physiological disorders, mental stress, lack of awareness, 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 significant force on the lower spine (5th lumbar vertebra and 1st sacrum).²²

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

Low back pain incidence in elderly respondents on CFD in Colomadu

The results of this study were obtained if the distribution of respondents based on the incidence of LBP in the Elderly on CFD in Colomadu who took part in the health check, which used the Keele Start Back Screening Tool questionnaire measurement with a minimum disability category of 20 respondents with a percentage of 50%, the moderate disability category was 15 respondents with a percentage of 37.5%. The severe disability category was 5 respondents with a percentage of 12.5%. Very severe disabilities were 0 respondents with a percentage of 0%. The incidence of LBP is lower back pain that can occur due to frequent lifting of heavy objects, non-ergonomic positions while working and positions reaching for objects/goods can cause several LBP complaints.⁵

According to Syukkur,²³ if there is a difference in pre-post pain after being given kinesiostaping in the intervention group (p-value <0.05) using the paired sample t-test, and there is a difference in pain between the intervention group and the control group (p-value <0.05) using the 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 kinesiostaping method. According to Analauw²⁴ there was a significant decrease in pain (p<0.0001) and a significant increase in functional ability (p<0.0001) after being given the Kinesiostaping method for 12 days which was assessed on the 12th day and the 30th day. So that Kinesiostaping can reduce pain and increase functional ability in LBP sufferers. So that pResearchers can conclude that the incidence of LBP in the elderly is most common in the minimal disability category, which amounts to 20 respondents with a percentage of 50% because most elderly people 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 check-up 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%). Administration of KT can reduce pain in elderly LBP patients, with the actual pain value before the intervention being 1.808 ± 0.286 and after the intervention the value was 2.466 ± 0.390 with an average difference of 0.658 ± 0.104 .^{25–27}

Acknowledgement

Suggestions: For further researchers: it is hoped that they can 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 LBP, and this research can be used as a basis or theoretical foundation for further research to be carried out. For the Elderly: The researcher hopes that after conducting research and obtaining the results of the LBP incident description and identifying the characteristics of respondents such as age, gender, it is hoped that the Elderly at CFD in Colomadu who participated in the health check-up can apply Kinesiotaping to reduce the incidence of LBP.

Conflict of interest

None.

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