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PENGARUH LATIHAN FELDENKRAIS TERHADAP PENURUNAN NYERI PUNGGUNG BAWAH PADA LANSIA DINAS SOSIAL PROVINSI BANTEN

THE EFFECT OF FELDENKRAIS EXERCISE ON REDUCING LOWER BACK PAIN IN ELDERLY SOCIAL SERVICES OF BANTEN PROVINCE

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Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh *Feldenkrais Exercise* untuk menurunkan nyeri pada lansia yang menderita nyeri punggung bawah di Panti Dinas Sosial Provinsi Banten. Metode penelitian yang digunakan adalah metode pre-experimental dengan rancangan Pre and Post Test with One Grup Design. Dengan membandingkan dua hasil evaluasi yaitu pre-test dan post-test. Pada penelitian ini *instrument* yang digunakan adalah *Numerical Rating Scales* (NRS) yang digunakan untuk menilai intensitas nyeri dengan menggunakan angka 1-10. Populasi dalam penelitian ini adalah lansia di Panti Dinas Sosial Provinsi Banten sejumlah 54 orang, sampel dalam penelitian ini berjumlah 10 orang, dengan menggunakan teknik *purposive sampling* yang memenuhi syarat kriteria inklusi. Dengan Teknik analisis data dalam penelitian ini menggunakan Uji Wilcoxon (Uji sampel berpasangan) yang merupakan uji non-parametrik. Berdasarkan Hasil uji hipotesis diperoleh bahwa hipotesis diterima, yaitu *feldenkrais exercise* berpengaruh terhadap penurunan nyeri punggung bawah pada lansia di Panti Dinas Sosial Provinsi Banten dimana diperoleh nilai rerata *positive rank* = 0,00 dan *negative rank* = 5,50, maka terjadi penurunan nyeri punggung bawah pada lansia. Berdasarkan hasil penelitian yang telah diuraikan dapat ditarik kesimpulan bahwa terdapat penurunan nyeri punggung bawah dibuktikan juga dengan hasil data dengan nilai sebesar 0,004 < 0,05 maka terdapat perbedaan yang signifikan. Hal ini menyimpulkan bahwa *feldenkrais exercise* dapat dijadikan program latihan yang mudah dilakukan oleh lansia dalam menurunkan nyeri punggung bawah.

Kata kunci: nyeri punggung bawah, terapi latihan, *feldenkrais exercise*, lansia.

Abstract

This study aims to determine the effect of Feldenkrais Exercise to reduce pain in elderly people suffering from low back pain at the Banten Provincial Social Service Home. The research method used is pre-experimental method with Pre and Post Test with One Group Design. By comparing two evaluation results, namely pre-test and post-test. In this study, the instrument used was Numerical Rating Scales (NRS) which is used to assess pain intensity using numbers 1-10. The population in this study were elderly people at the Banten Provincial Social Service Home totaling 54 people, the sample in this study amounted to 10 people, using purposive sampling technique that met the inclusion criteria. With the data analysis technique in this study using the Wilcoxon Test (paired sample test) which is a non-parametric test. Based on the results of hypothesis testing, it is found that the hypothesis is accepted, namely Feldenkrais exercise has an effect on reducing low back pain in the elderly at the Banten Provincial Social Service Home where the average value of positive rank = 0.00 and negative rank = 5.50, so there is a decrease in low back pain in the elderly. Based on the results of the research that has been described, it can be concluded that there is a decrease in low back pain as evidenced by the data results with a value of 0.004 <0.05, so there is a significant difference. This concludes that Feldenkrais exercise can be used as an exercise program that is easy for the elderly to

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do in reducing low back pain.
Keywords: *lower back pain, exercise therapy, feldenkrais exercises, elderly*

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INTRODUCTION

Humans will experience a degenerative aging process that has an impact on body changes, this will definitely be experienced and cannot be avoided by anyone (Ferrucci et al., 2020). These changes will occur in the musculoskeletal system which can reduce function and strength including in muscles, joints, bones, ligaments and tendons (Frontera, 2017). The World Health Organization (WHO) states that the age of 60 years and over will be said to be elderly (elderly), one of the changes that is often found in the elderly is experiencing a decrease in muscle strength. This can result in the elderly being more at risk of injury or disease, one of which is low back pain (Hartvigsen et al., 2018).

In 2020 low back pain affected 619 million people worldwide and is expected to increase to 843 million cases by 2050, due to population expansion and aging (Ferreira et al., 2023). The prevalence of low back pain is around 80% in the general population, occurring at least once in their lifetime. The prevalence in Indonesia of people who experience low back pain reaches around 18-29% (Prabaningtyas, 2021). In Indonesia, there are many people who experience low back pain, especially in the elderly, by the Indonesian people low back pain is often referred to as low back pain, the effect can be so severe on the body that it makes a person unable to do something (Saputri et al., 2023). Complaints of low back pain can occur at any time and can occur in everyone, many factors trigger the occurrence of complaints such as age, gender, body mass index, physical activity and work (Andini, 2015).

Low back pain that occurs in the elderly or elderly (aged 60-74 years) can be caused by a decrease in physiological function and a decrease in physical condition so that they will experience stiffness, pain or pain that can occur in the muscles along the spine, namely from below the neck to the tailbone (Yuliadarwati et al., 2019). Pain in low back pain is felt in the lower back, affecting the tissues and muscle components around the lumbar and pelvic regions (Hartvigsen et al., 2018).

Efforts to prevent and treat low back pain can be done by exercising, exercise therapy, manual therapy or therapeutic modalities (Owen et al., 2020). Currently, one of the treatments that can improve motion function is by doing exercise therapy. However, people with low back pain tend to avoid these activities due to fear, this can worsen symptoms and cause permanent damage (Setchell et al., 2017). In most cases that occur, avoiding physical activity will prolong the recovery process and in some people will increase the likelihood of depression until they can experience chronic low back pain (Prabaningtyas, 2021). Although there is no suitable exercise programme for all people with low back pain cases, exercise therapy that is easy to do will be an effort to recover from low back pain cases, especially in the elderly with limited movement that occurs in the elderly body.

So one of the exercise programmes that is light and easy to do by the elderly will be an alternative way for the elderly to continue to exercise, so that this will accelerate the recovery of injuries that occur (Chou et al., 2017). The exercise method that will be used is Feldenkrais Exercise with a lightweight exercise method that is easy for the elderly to do, with movements that are carried out to increase relaxation and focus on focusing on thoughts, emotions, vision and regulating breathing patterns (Sadu, 2020). In Saputra & Syakib's research, there is a significant difference in influence between Feldenkrais Exercise and William Flexion Exercise

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in improving functional activity in people with myogenic low back pain where Feldenkrais Exercise is better than William Flexion Exercise (Saputra & Syakib, 2018).

Exercise programmes for low back pain will continue to evolve over time, but have the same goal of maintaining muscle and spinal stability (Suh et al., 2019). The Feldenkrais Exercise method used in this study is a mild exercise that utilises body balance, body movement safety and most importantly, body awareness by involving a number of dynamic balance and flexibility movements to improve the ease of walking, travelling, getting up from sitting, performing daily activities and reducing the risk of falls (Bipinbhai, 2013). The Feldenkrais Exercise method is to help a person move more easily, comfortably and efficiently by using an exploratory learning approach (Stephens & Hillier, 2020). This method has repetitive movements of input from the motor and sensory systems that will focus on controlling and coordinating movements with the principle of making the least effort to move and get maximum results (Henry et al., 2016).

However, previous studies have only explained functional activity in people with myogenic low back pain where Feldenkrais Exercise is better than William Flexion Exercise. This study focused on giving Feldenkrais Exercise to reduce pain in the elderly. The condition of the elderly in the banten provincial social service orphanage who have complaints of low back pain does not have knowledge of how they can reduce the pain. So that makes the researcher interested in providing Feldenkrais execise treatment, which has the aim that the elderly in the banten provincial social service institution can at least reduce the pain they suffer. Based on this background, this study will use Feldenkrais exercise, because researchers want to know how much influence this method has on reducing pain experienced by sufferers of low back pain, especially in the elderly.

METHOD

This research uses quantitative research. Quantitative Research Methods are research methods based on the philosophy of positivism, used to research on certain populations or samples, data collection using research instruments, quantitative or statistical data analysis, with the aim of testing the hypothesis set. The research method used in this research is the pre - experimental method with the Pre and Post Test with One Group Design. The sampling technique in this study used purposive sampling technique, this technique is a sampling technique by determining certain criteria. By comparing two evaluation results, namely the pre-test and post-test, where in this study, only has 1 group. The group or sample was given Feldenkrais Exercise exercises for 1 month as many as 12 meetings for 3 times a week, with a duration of 15 minutes. Treatment was given in the form of Feldenkrais Exercise, namely streching neck, cat and camel, knee twist, torso rotation, pelvic tilt and trunk rotation given to the elderly. regularly 3 times a week for 1 month. This research was conducted at the Banten Provincial Social Service, the time of this research was carried out taking pre-test data on 1 August to taking post-test data on dates up to 4 September 2023.

Population is the totality of each element to be studied that has the same characteristics, it can be an individual from a group, event, or something to be studied (Handayani et al., 2020). The population in this study were 54 elderly people at the Banten Provincial Social Service Home. The sample is part or representative of the population studied. Based on the inclusion and exclusion criteria, the sample in this study amounted to 10 people. The following inclusion criteria in this study are: Suffering from low back pain, elderly, aged 60 years and over, female, cooperative and willing to participate in the research programs. Exclusion criteria are, suffering from low back pain and pain in other parts, Using activity aids (wheelchairs, canes, etc.), Bedrest (deafness, speech disorders, visual impairment, mental or mental disorders) and Men.

The data collection technique in this study is the measurement of pain levels, data collection technique is a way to obtain data that is in accordance with the research being carried

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out (Ganesha & Aithal, 2022). The following are data collection techniques in this study, namely: pre-test data collection (pre-test) The pre-test aims to obtain initial data on the research sample regarding pain levels. Measuring the level of elderly pain using Numerical Rating Scales is given a number from 0 – 10, meaning that the number 0 is said to be painless, 1-3 is said to be mild pain, 4-6 is said to be moderate pain, 7-10 is said to be severe pain, then the elderly mentions the number according to their situation. Then Implementation of research the treatment carried out refers to the exercise programme that has been prepared. The research process was carried out with 12 meetings with 3 times a week with a duration of 15 minutes. The treatment is given in the form of Feldenkrais Exercise exercises given to the elderly. And collecting the final test (Post-test) in this study using a pain level test which aims to determine the final results after treatment (Sugiyono, 2018). Measuring the pain level of the elderly using Numerical Rating Scales is given a number from 0-10 with the following procedure, before measuring the patient is given an explanation of the measurements to be carried out and the procedure, the patient is asked to look carefully at the Numerical Rating Scales in order to understand the number to be designated according to the pain felt, the patient points a line or marks a line according to the intensity of pain felt, numbers on the Numerical Rating Scales are better not displayed so that patients are not affected by the existing numbers, the researchers explained about the meaning that exists in the scale and then the elderly mentions the number according to their situation, the difference in the end of the test can be compared between the pre-test and the post test. Meanwhile, the final difference in the test can be compared between pre-tests that aim to obtain preliminary data on research samples regarding pain levels. Measuring the pain level of the elderly using Numerical Rating Scales is given a number from 0 - 10 then the elderly says the number according to their situation and the post-test in this study used a pain level test aimed at determining the final result after treatment. Measuring the pain level of the elderly using Numerical Rating Scales is given a number from 0-10 then the elderly says the number according to their situation, The final difference in the test can be compared between pretest and post-test. In this study the instrument used was as Numerical Rating Scales (NRS). Measurements using Numerical Rating Scales are used to assess pain intensity using numbers. In the Numerical Rating Scales method, the visualisation is a 10 cm line span (Nugent et al., 2021). The design of this study is as follows:

(1)

Description:
O1: The sample was measured on the pain scale before being given the Feldenkrais Exercise treatment.
X1: Feldenkrais exercise for 3 times a week for 1 month
O2: The sample measured the pain scale after being given the Feldenkrais Exercise treatment.

Data analysis techniques in this study include descriptive analysis in the form of mean and standard deviation, normality test using Shapiro-wilk test, and data hypothesis test in this study using Wilcoxon test. The Wilcoxon test (paired sample test) or also known as the Wilcoxon signed rank test is a non-parametric test. Aims to determine whether there is a difference in average between 2 samples (2 groups) that are paired / related.
The basis for decision making in the Wilcoxon test, namely:

a. If the Asymp.Sig (2-tailed) value <0.05, it is stated that there is a significant difference between the pre-test and post-test data results, then Ho is rejected and Ha is accepted.
b. If the Asymp.Sig (2-tailed) value > 0.05, it is stated that there is no significant difference between the pre-test and post-test data results, then Ho is accepted and Ha is rejected.

Description:

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- Ho = There is no decrease in low back pain in the elderly
- Ha = There is a decrease in low back pain in the elderly

RESULT

The data description below is intended to obtain an overview of the mean and standard deviation data on the age, weight, height and BMI data variables. Descriptive statistics of Pre-test and Post-test low back pain in the elderly, while the data is presented as follows:

Table 1. Description of Characteristics of Research Subjects

No	Variables	Average	SD
1	Age	62,2	1,988
2	Body Weight	54,3	2,830
3	Body Height	154,1	2,923
4	BMI	25,201	0,836

Source: Research data, 2023

From the data results of the table above shows the description of pre-test and post-test data with a sample size of 10 (ten) people obtained an average age score of 62.2, average weight of 54.3, average height of 154.1 and average BMI of 25.201 and obtained a standard deviation value of age of 1.988, standard deviation of body weight of 2.830, standard deviation of height of 2.923 and standard deviation of BMI of 0.836.

Table 2. Basic Data of NRS Results of Research Subjects

Sample	Pre-test	Post-test
1	8	4
2	6	3
3	6	2
4	8	4
5	6	2
6	6	3
7	7	3
8	6	2
9	7	3
10	8	3
Average	6,8	2,9
SD	0,919	0,738
Max	8	4
Min	6	2

From the data in the table above, it shows the basic data of the NRS results of the pre-test and post-test research subjects with a sample size of 10 (ten) people, the pre-test average score is 6.8, the average indicates that the elderly are classified as having moderate pain and the post-test average is 2.9, Based on the average, the elderly are classified as having mild pain the pre-test standard deviation is 0.919 and the post-test standard deviation is 0.738, the pre-test maximum value is 8 and the post-test is 4, the pre-test minimum value is 6 and the post-test is 2. The higher the measurement value, the higher the level of pain, while the lower the measurement value, the lighter the pain. This is the reason why pre-test scores are higher than post-test scores. If displayed in the form of a histogram, the pre-test and post-test description data on low back pain are as follows:

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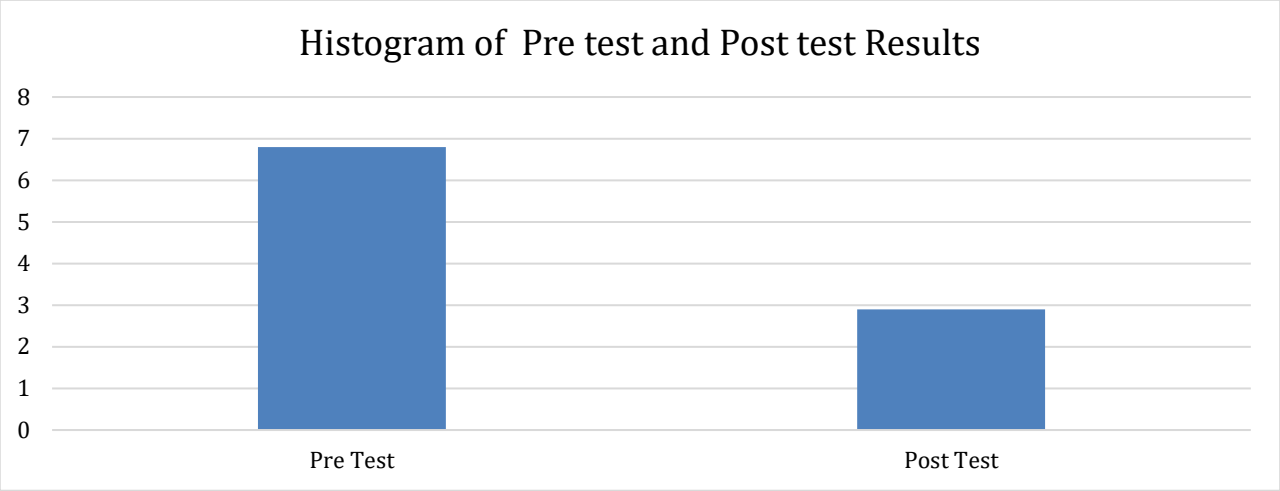

Picture 1. Histogram of Pre-test and Post test results

The results of the data normality test in this study used the Shapiro-wilk test. The results of the data normality test from different groups were carried out using the SPSS programme with a significance level of 5% or 0.05. The following results were obtained:

Table 3. Normality Test

Pre-Test	Post-test	Significance	Description
0,000	0,015	0,05	Not Normally Distributed

From the results of this normality test, the pre-test significance value is 0.000, which means that the significance is <0.05, so the research data is not normally distributed and the post-test significance value is 0.015, which means that the significance value is <0.05, so the research data is not normally distributed.

Table 4. Hypothesis Test

Post-test – Pre-test	N	Mean Rank	Sum of Ranks
Negative Ranks	10	5,50	55,00
Positive Ranks	0	0,00	0,00
Ties	0		
Total	**0**		

Based on the results of descriptive analysis, the average value of positive rank (increase) = 0.00 and negative rank (decrease) = 5.50, there is a decrease in low back pain in the elderly. Thus, that the provision of feldenkrais exercise has a significant effect on reducing low back pain in the elderly of the Banten Provincial Social Service Home.

The results of hypothesis testing in this study were carried out based on data analysis and interpretation of Wilcoxon test analysis. The sequencing of hypothesis test results is adjusted to the hypothesis as for the results of hypothesis testing as follows:

Table 5. Hypothesis Testing

Group	Wilcoxon Test Sig. (2-tailed)
Pre test Post test	0,004 < 0,05

From the results of hypothesis testing using the Wilcoxon test, it is stated that if the sig. (2-tailed) < 0.05, then there is a significant difference between the results of the pretest and

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post-test and if the sig value. (2-tailed) > 0.05, then there is no significant difference between the pre-test and post-test results. In table 5, the data results are obtained with a value of 0.004 <0.05, so there is a significant difference. Based on the output table of the wilcoxon test results, the sig value = 0.004 is obtained, which means it is smaller than 0.05. thus, Ho is rejected and Ha is accepted. So, it can be concluded that the hypothesis that reads "There is an Effect of Feldenkrais Exercise on Reducing Lower Back Pain in the Elderly of the Banten Provincial Social Service Home" has been proven. The results showed a decrease in the average value (mean) of the results obtained during the measurement of low back pain. Before doing Feldenkrais exercise, it was 6.8 and at the time of the lower back pain measurement test after doing Feldenkrais exercise, it was 2.9 and there was a negative rank value (decrease) of pain of 5.50.

DISCUSSION

Based on hypothesis testing, it is known that there is a significant effect of using the Feldenkrais exercise method on reducing low back pain in the elderly of the Banten Provincial Social Service Home. Decreasing pain in people with low back pain is very important because with decreased pain, people with low back pain can carry out their daily activities without interference.

In research Feldenkrais exercise can reduce pain caused by muscle spasm in the elderly because in Feldenkrais exercise there is body balance training, in its physiological function the visual system works to anticipate all upcoming disturbances from the surrounding environment and becomes an important component of a balance, while the vestibular system regulates eyeball movement and head control and the somatosensory system provides information that is felt by body movement and its position (Laurensius, 2022). The Feldenkrais Exercise was created to help those with restricted or reduced range of motion as a result of injury, chronic pain, or other physical or neurological issues (Hillier & Worley, 2015). Other studies explain that the Feldenkrais exercise allows individual to achieve a pattern of pain-free movement with concentration on awareness their own biomechanics (Plastaras et al., 2011). Considering the importance of transverse abdominis muscle in the treatment and prevention of low back pain, the Feldenkrais method could be an effective approach in planning for low back pain treatment programmes (Ahmadi et al., 2020). Exercise therapy aiming at motorcontrol and strengthening of the core stability muscles including the transverse abdominis and the lumbar multifidus is a leading strategy in treatment and prevention of low back pain (Kiesel et al., 2008; Oliveira et al., 2018).

In the elderly, proprioceptive disorders cause a decrease in muscle mass and muscle strength which leads to an increased risk of falls, limited daily activities and the disappearance of mecanoreceptors, causing disruption of proprioceptors and balance (Yuliadarwati et al., 2018). Evidence suggests that feldenkrais exercises have therapeutic effects comparable to other physiotherapy techniques in patients with spinal pain. In addition, improved mobility and balance were seen in the elderly and people with neurodegenerative diseases (Berland et al., 2022). In addition, there is muscle strength training, Feldenkrais exercise has the benefit of strengthening the muscles of the spine so that the body is physiologically upright, exercises that are done properly and correctly will increase muscle strength actively so that it is called active stabilisation. Increased muscle strength also has the effect of increasing the body's resistance to changes in movement or loading statically and dynamically, and will also improve the circulatory system and reduce pain through the gate control mechanism and pain reduction through beta endorphin. This exercise can activate the inner muscles of the back extensor so that muscle synergy is better, so that muscles that often experience spasm can work lighter (Rizkillah, 2019). There are flexibility exercises, with lumbar mobilisation exercises performed in the elderly showing that an increase in the viscoelastic properties of the nerves, resolution of edema and restoration of normal physiological properties lead to pain reduction. Pain

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reduction with neurodynamic techniques can improve the functional status of the elderly. Rest after exercise also needs to be done so that maximum recovery in the muscles so as to minimise the incidence of injury after exercise (Satria, 2022).

In accordance with research conducted previously by Mohan, it is said that training using feldenkraise can increase paralumbar muscle relaxation and provide activation to the deep extensor muscles so that it is very effective for myogenic low back pain (Mohan et al., 2017). In a study conducted by Paolucci et al. back school exercises and the Feldenkrais method had similar efficacy on chronic pain reduction (McGill score) and quality of life (Short Form (SF)-36 Health Survey) at the end of the intervention in patients with chronic low back pain, Meanwhile, at the follow-up stage the Feldenkrais method had better efficacy in reducing pain (Paolucci et al., 2017). According to previous research, it has been explained that the Feldenkrais exercise training program can reduce lower back pain and neck pain (Sheikh et al., 2023). In addition, other studies explain the advantages of feldenkrais exercise that the feldenkrais exersice intervention provides increased benefits in improving the quality of life, Increase interoceptive awareness, reduce disability index, and improving the quality of life and decreasing Disabled (Ahmadi et al., 2020).

The results of hypothesis testing obtained that the hypothesis is accepted, namely Feldenkrais exercise has an effect on reducing low back pain in the elderly at the Banten Provincial Social Service Home. This can be seen from the data results of each test, both the initial test data (pretest) and the final test data (posttest). In the lower back pain measurement test, there is a difference between the results of the initial test (pretest) and the final test (posttest) data results with a value of 0.004 <0.05, and obtained a mean value of positive rank = 0.00 and negative rank = 5.50, so there is a decrease in low back pain in the elderly.

Thus, the occurrence of these differences is due to Feldenkrais exercise is an exercise to reduce low back pain in the elderly and it can be concluded that the provision of feldenkrais exercise has a significant effect on reducing low back pain in the elderly of the Banten Provincial Social Service Home.

The weakness of this study is that it only discusses the effect of feldenkrais exercise on reducing low back pain in the elderly, besides that there is still a lack of samples given intervention so that researchers further need to add samples to strengthen the results of this study.

CONCLUSION

Based on the discussion above, it can be concluded that there is an effect of Feldenkrais exercise on reducing low back pain in the elderly social service of banten province. Decreasing pain in people with low back pain is very important because with decreased pain, people with low back pain can carry out their daily activities without interference. Feldenkrais Exercise can reduce pain caused by muscle spasm in the elderly because in Feldenkrais Exercise there is body balance training, in its physiological function the visual system works to anticipate all upcoming disturbances from the surrounding environment and becomes an important component of a balance, while the vestibular system regulates eyeball movement and head control and the somatosensory system provides information that is felt by body movement and its position. Feldenkrais Exercise has the benefit of strengthening the muscles of the spine so that the body is physiologically upright, exercises that are done properly and correctly will increase muscle strength actively so that it is called active stabilization. Increased muscle strength also has the effect of increasing the body's resistance to changes in movement or loading statically and dynamically, and will also improve the circulatory system and reduce pain through the control gate mechanism and pain reduction through beta endorphin.

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