E-ISSN: 2962-6110
jsret.knpub.com
JSRET
Journal of Scientific Research, Education, and Technology

The Effectiveness of Knee Exercise to Pain Intensity in Elderly Patients of Knee Osteoarthritis

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ABSTRACT

Pain is a physiological reaction due to a protective reaction to avoid stimuli that harm the body. Based on the results of the preliminary study, it was found that there were still many patients who experienced pain in the elderly with *osteoarthritis* . The purpose of this study was to analyze the effect of knee exercise therapy on reducing the level of knee *osteoarthritis pain intensity* . The research design is a *quasy experiment.* The population is 184 elderly with a sample of 32 respondents using *simple random sampling* . The independent variable is knee exercise therapy and the dependent variable is pain intensity in the elderly who suffer from *osteoarthritis* . The research instrument is the pain scale observation sheet. This study uses an observation sheet . Data analysis used the *Wilcoxon test and the Mann Whitney* test .Based on statistical test results *Wilcoxon* obtained *p value* (0.001) < α (0.05) meaning that there is a difference in pain intensity after being given knee exercise therapy, *Wilcoxon* statistical test results obtained *p value* (0.122) < α (0.05) meaning there is a difference in pain intensity after being given deep breathing relaxation therapy and the results *Mann Whitney* statistical test obtained *p value* (0.003) <α (0.05) meaning that there is a difference in pain scale after being given knee exercise therapy and deep breathing relaxation. Knee exercise therapy is effective in reducing pain intensity in patients with *osteoarthritis.* Researchers hope that health workers will maintain and continue providing health education on knee exercise therapy in non-pharmacological management of the elderly with *osteoarthritis.*

Keywords: *Elderly, Osteoarthritis, Pain, Knee Exercise*

INTRODUCTION

Older people are more prone to health problems due to poor physical function due to aging. The process of aging is a process that leads to changes that include physical, psychological, social and mental changes. Entering old age, individuals experience weakness, both physically which is marked by graying hair, sagging skin, slow movement, blurred vision, and unbalanced body posture and disease in the joints (Senja, 2019) . One of the joint diseases experienced by the elderly is knee pain due to knee osteoarthritis (Mumpuni, 2017).

Pain is a physiological reaction because of a protective reaction to avoid stimuli that harm the body and pain is also a form of warning against the dangers of tissue damage. Kurniawan, (2015) *Osteoarthritis* is a chronic disease that attacks the joints and surrounding bones. *Osteoarthritis* was previously thought of as a degenerative disease due to joint damage, but current research shows that in addition to the damage there is also an inflammatory process that predisposes to the injury.

Osteoarthritis is one of the 10 most common diseases in the world and causes disability in developing countries. It is estimated that worldwide 9.6% of men over the age of 60 years and 18.0% of women have symptoms of osteoarthritis (*World Health Organization* , 2019). According to Basic Health Research (Riskesdas, 2018), the prevalence of people with *Osteoarthritis* in Indonesia reaches 713,783 people, all cases of joint pain in Indonesia reach 23.6 % - 31.3%. This figure shows that pain due to *osteoarthritis* is quite disturbing to the activities of the Indonesian people, the prevalence in East Java has reached 75,490 people, and the prevalence in Bangkalan has reached 1,767 people (Riskesdas, 2018).

METHODS

The design in this study uses a quasi experiment (*Quasi experiment*) with the *Pre-Post With Control Design approach* .

In this study, data were collected from 32 respondents who were distinguished from the control and treatment groups, where the 32 respondents were divided into two, namely the treatment group and the control group. In the control group, pain was observed and without knee exercise therapy. Whereas in the treatment group the initial pain observation was carried out and continued with knee exercise therapy , and after that the final pain observation was carried out.

FINDING AND DISCUSSION

Table 1 : .General Data

No	AGE (Year)	GROUP			
		TREATMENT		CONTROL	
		f	(%)	f	(%)
1	60-74 years	12	75.0	16	100.0
2	75-90 years	4	25.0	0	0
	Total	16	100.0	16	100.0

Source: Primary Data 2022

Based on the results above, it shows that in the treatment group, the majority of respondents aged 60-74 years were 12 respondents with a percentage of 75.0%, while in the control group, the majority of respondents aged 60-74 years were 16 respondents with a percentage (100.0%).

Table 2 : .Special Data

Custom Data

Frequency distribution based on pain scale treatment group

Respondent code	Pre-test	Post test
1	5	3
2	8	8
3	5	3
4	4	3
5	4	3
6	6	4
7	7	7
8	8	8
9	7	5
10	6	5
11	7	6
12	9	9
13	8	6
14	5	3
15	6	4
16	5	3
Positive ranks	0	
Negative ranks	12	
ties	4	
Wilcoxon test	p:0.001	α:0.05

Primary data June 2022

From the results of the different test using the Wilcoxon test, it was found that ρ: 0.001 where the significance is smaller than α (0.05) so that it can be concluded that there are differences in the pre and post pain scales.

Skill Frequency Distribution based on the observation sheet in patients experiencing pain in the control group osteoarthritis patients

Respondent code	Pre-test	Post test
1	7	7
2	5	6
3	6	6
4	7	6
5	5	7
6	5	7
7	6	6
8	5	6
9	4	3
10	5	6
11	6	6
12	5	7
13	5	7
14	6	6
15	4	5
16	5	7
Positive ranks	9	
Negative ranks	2	
ties	5	
Wilcoxon test	p:0,122	α:0.05

Source: primary data for 2022

From the results of the different test using the Wilcoxon test obtained ρ: 0.122 where the significance is greater than α (0.05) so that it can be concluded that there is no difference in the Pre pain scale and the Post pain scale.

Comparative distribution of pain scale results between the treatment group and the control group

Respondent code	Post treatment	control post
1	3	7
2	8	6
3	3	6
4	3	6
5	3	7
6	4	7
7	7	6
8	8	6
9	5	3
10	5	6
11	6	7
12	9	7
13	6	7
14	3	8
15	4	5
16	3	7
Means	5	6,1
The Mann Whitney test	p:0.003	α:0.05

From the results of the different test using the *Mann Whitney test, it was* found that ρ: 0.003 where the significance is smaller than α (0.05) so that it can be concluded that there is a difference in the pain scale after being given knee exercise therapy (post treatment) and the pain scale given deep breathing relaxation (post control).

DISCUSSION

Differences in the observed value of the pain scale in Knee *Osteoarthritis patients* in the elderly before and after being given Knee Exercise Therapy (treatment group)

Based on the Wilcoxon test results obtained ρ: 0.001 where the significance is smaller than α (0.05) indicating there is a difference in the observed value of pain intensity Pre and Post pain intensity values.

According to the researcher's analysis, all light sports activities and types of gymnastics can inhibit the aging process because a moving body can reduce cytokine levels and increase noxious stimuli so that it can inhibit the transfusion process so that the pain mechanism is hampered and pain is reduced by doing knee exercises for 1 week in a row 2 times a day with a duration of 30 minutes so as to reduce pain intensity.

according to research conducted by Benner et al (2019) in north America who say that sanya knee exercise in osteoarthritis patients , effective for reducing pain intensity ,

reduce symptoms, increase joint range of motion, and improve joint function in osteoarthritis patients.

corroborated by research conducted by Yunian, DKK (2021) who said that Women are more susceptible and more severely affected by osteoarthritis than men. Boys are more often affected by osteoarthritis at an early age than women , but the incidence osteoarthritis in middle adulthood at women outnumber men . Most of the factors that cause osteoarthritis in women are modifiable obesity . Frequency of male and female osteoarthritis at the age of under 45 years the same between the two , but the frequency of osteoarthritis increases in women after menopause or over 50 years. Incident increase Osteoarthritis in aging women is caused by a decrease in the hormone estrogen .

Differences in the observed value of pain scales in Knee Osteoarthritis patients in the elderly before and after being given a deep breathing relaxation technique (control group).

From the results of the different test using the Wilcoxon test , ρ is obtained: 0.122 > α (0.05) indicates that there is no difference in the observed value of pain intensity Pre and assess pain intensity Post.

Researchers argue that deep breathing relaxation techniques are very beneficial for the elderly who experience pain in osteoarthritis patients because deep breathing relaxation techniques can stimulate the body to excrete endogenous opoids . and a pressure system is formed and causes the intensity of pain to decrease . However, in this study, the deep breathing relaxation technique did not show results that were similar to the results of previous studies. This is because the results of the paired test using the Wilcoxon test obtained p: 0.122 > 0.05 indicating that there was no difference in the value of pain intensity before and after the deep breathing relaxation technique was given. based on the results of interviews with several respondents, respondents said they did not do deep breathing relaxation routinely because they did not receive supervision from researchers and respondents did deep breathing relaxation without Standard Operating Procedures (SOP).

This study is inversely proportional to research conducted by Aningsih (2018) which says that deep breathing relaxation techniques can increase lung ventilation , reduce pain intensity , and increase oxygen levels in the blood. Then it is not in line with the research conducted by Marni (2014) which stated that after being given a deep breathing relaxation technique there were no patients with severe pain intensity but, moderate and mild pain intensity increased.

Differences in Knee Osteoarthritis pain intensity in the elderly between the 2 groups that were given Knee Exercise and deep breathing relaxation techniques (treatment and control).

From the results of a different test using the *Mann Whitney test, it was* found that ρ:0.03 <α (0.05) showed that there was a difference in the *osteoarthritis knee pain scale* in the elderly (post treatment) and the *osteoarthritis knee pain scale* in the elderly (post control).

Researchers argue that knee exercises can affect pain intensity in elderly patients with *osteoarthritis* if they are done regularly properly and correctly. The decrease in the pain scale was due to the fact that respondents were able to properly follow information or suggestions from researchers . The benefits of knee exercise can show optimal results . Decline in musculoskeletal function is caused by the aging process. Decreased musculoskeletal function causes various complaints including : pain, feeling and weakness, stiffness . Musculoskeletal is main manifestation of the disorder musculoskeletal is joint pain. Degenerative F factors cause joint pain in the elderly . While predisposing factors include individual age , physical activity , gender, stress , diet , and illness . Increased interosseous pressure is caused by the process of cartilage degeneration in the elderly caused by overgrowth of bone at the joint margins a lump occurs . This can stimulate pain receptors and be responded to in the cerebral cortex as joint pain.

This is in line with research conducted by Taufandas (2018) which stated that 15 elderly people experienced *osteoarthritis* after being given knee exercise therapy for 6 consecutive days for ± half an hour . and experienced a decrease in the intensity of effective joint pain. strengthened by research conducted by Firmansyah (2021) after knee joint motion the respondent experienced a decrease in the pain scale due to behavior and intervention.

CONCLUSSION

There is a difference in the observed value of the pain scale in the pre and post treatment groups given knee exercise therapy in knee osteoarthritis patients the working area of the Kwanyar Health Center.

There was no difference in the observed value of the pain scale against *the control group pre and post* given deep breathing relaxation therapy in knee *osteoarthritis patients in* the working area of the Kwanyar Health Center.

There is a difference in the effectiveness of knee exercise and deep breathing relaxation techniques on pain levels in the elderly with osteoarthritis in the working area of the Kwanyar Health Center. It is hoped that the elderly can understand about *Osteoarthritis* so they can do knee exercises independently. It is hoped that future researchers can develop about osteoarthritis in the elderly using other variables so that it can be used as an ingredient in non-pharmacological treatment.

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