



## The effect of gymnastics on the changes of osteoarthritis pain in elderly

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### ABSTRACT

**Background:** Osteoarthritis is a chronic joint disorder with a process of attenuation and disintegration of joint cartilage accompanied by bone growth and new cartilage in the joints. Patients with osteoarthritis occur at the age of 40-60 years; one of the roles of nurses in improving the quality of life of the elderly is to overcome health problems that commonly occur in the elderly. One of them is joint pain management due to osteoarthritis by using non-pharmacological therapy in the form of elderly exercises.

**Objective:** Identify the influence of elderly gymnastics on changes in osteoarthritis pain in social institutions Tresna Werdha Budi Sejahtera Banjarbaru.

**Method:** This study uses a quantitative method with experimental quasi with the research design used is a pretest-posttest one group design. Initial data collection before and after intervention.

**Results:** Respondents who experienced knee osteoarthritis pain before elderly exercise can be seen that most respondents have characteristics of moderate pain. The biggest complaint presentation was experiencing moderate pain, which was 30 people (100%) on the first day. Wilcoxon test results found the quality of knee osteoarthritis pain in the elderly before and after a significant compress. This is based on the p-value of 0.000, which means that there is an influence of elderly gymnastics on reducing the quality of knee osteoarthritis pain in the elderly in social care institutions because there is prosperity in Banjarbaru.

**Conclusion:** There is a relationship between the effect of elderly gymnastic therapy to reduce osteoarthritis of knee pain suffered by the elderly.

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## 1. Introduction

Osteoarthritis is a chronic joint disorder in which there is a process of weakening and disintegration of the joint cartilage accompanied by the growth of new bone and cartilage in the joint. This disorder is a degenerative process in the joints that can affect one or more joints often



experienced by the elderly (Marliana, 2015).

According to the World Health Organization (WHO), osteoarthritis sufferers globally reach 151.4 million people, and 27.4 million people are in Southeast Asia (Masyhurrosyidi, 2013). In Indonesia, in 2009, osteoarthritis sufferers reached 5% at the age of < 40 years, 30% at the age of 40 – 60 years, and 65% at the age of > 60 years, in men and 12.7% in women of all sufferers osteoarthritis (Soeroso et al., 2009). Based on data from the Statistical Center Agency (2013) shows that in South Kalimantan, the number of osteoarthritis cases among the elderly is 29,653, which is in fifth place.

The National Program to improve public health among the elderly is the Healthy Indonesia Program, with the target of improving the level of health and nutritional status of the community through health efforts and community empowerment supported by financial protection and equitable distribution of health services in the 2015-2019 period, in addition to efforts from the City Government Banjarmasin, South Kalimantan, through the local Health Service, has developed Integrated Service Posts (Posyandu) for the elderly which function to provide the best health services for elderly residents, with 68 elderly Posyandu in 2012.

Non-pharmacological therapy is recommended for elderly patients because it does not cause drug side effects (Sitinjak, 2016). This is confirmed by research according to Ayu & Warsito (2012), which states that exercise for the elderly is more effective in treating knee pain (p-value 0.001). This is confirmed by Adnyana's research (2016), which states that elderly exercise affects the functional abilities of elderly people who experience low back pain (p-value 0.05).

One of the roles of nurses in improving the quality of life of the elderly is to overcome health problems that commonly occur in the elderly. Includes medication, joint protection by correcting poor body posture, diet, psychosocial support, sexual problems, surgery and conservative therapy (Afrianti, 2013). One of them is treating joint pain in the elderly using non-pharmacological therapy, namely elderly exercise, to determine the pain level in the elderly (Handono, 2013).

Based on a preliminary study conducted on Saturday, 22 July 2017, by researchers at the Trisna Werdha Budi Sejahtra Social Institutions, Banjarbaru, totalling 109 people, it was found that 65 elderly people complained of osteoarthritis joint pain at the Trisna Werdha Budi Sejahtra Social Home, Banjarbaru. Friday, but not all elderly people can participate because some elderly people suffering from osteoarthritis are afraid to take part in this exercise, which, according to them, will make their condition worse, so with this phenomenon; researchers are interested in finding out the effect of elderly exercise in treating osteoarthritis pain.



## 2. Method

The research method used is quantitative research with a Quasi-Experimental research design used by researchers using a pretest-posttest one-group design. Initial data collection before and after the intervention (Sujarweni, 2014). The participants in this research were chosen using a total sampling technique, namely 30 elderly people from social institutions. Participants then take part in an exercise intervention program. Pain measurements were carried out before and after the intervention was carried out. The data obtained was then analyzed using SPSS.

## 3. Results

### Respondent characteristics

#### *Ages*

In Table 1, it can be seen that the characteristics of respondents based on age are that of the 30 respondents, the highest rates from patients were aged 65-69 years, namely 14 respondents (46.7%), and the lowest rates from patients were aged 70-75 years, 6 respondents.

Table 1. Respondent age characteristics

| Usia Respondent | Frequency (n) | Percentage (%) |
|-----------------|---------------|----------------|
| 60-64           | 10            | 33,3           |
| 65-69           | 14            | 46,7           |
| 70-75           | 6             | 20,0           |
| Total           | 30            | 100            |

#### *Gender*

In Table 2, the characteristics of respondents based on gender can be seen that of the 30 respondents, the most patient raters were male, namely 17 respondents (56.7%), and the least were female, namely 13 respondents (43.3%). %).

Table 2. Respondent gender characteristics

| Gender | Frequency (n) | Percentage (%) |
|--------|---------------|----------------|
| Man    | 17            | 56,7           |
| Women  | 13            | 43,3           |
| Total  | 30            | 100            |

#### *Diagnose period*

In Table 3, respondents who were mostly elderly had a long diagnosis period of 3-4 years, 14 people (46.7%).

**Table 3. Respondent diagnose period**

| Diagnose period (years) | Frequency (n) | Percentage (%) |
|-------------------------|---------------|----------------|
| 1-2                     | 3             | 10,0           |
| 3-4                     | 14            | 46,7           |
| 5-7                     | 13            | 43,3           |
| Total                   | 30            | 100            |

**Pain levels in the pre-gymnastic intervention**

Table 4 shows the number of respondents who experienced knee osteoarthritis pain before the elderly did exercise. It can be seen that the majority of respondents have moderate pain characteristics. The most frequent complaint presentation on the first day was moderate pain with a percentage of 100%.

**Table 4. Osteoarthritis pain level in the pre-gymnastic intervention**

| Pain levels     | Frequency (n) | Percentage (%) |
|-----------------|---------------|----------------|
| No pain         | 0             | 0              |
| Mild pain       | 0             | 0              |
| Moderate pain   | 30            | 100.0          |
| Severe pain     | 0             | 0              |
| Unbearable pain | 0             | 0              |
| Total           | 30            | 100.0          |

**Pain levels in the post-gymnastic intervention**

Table 5 shows that there was a reduction in the level of knee osteoarthritis pain after being given intervention for 8 consecutive days. The levels of knee osteoarthritis pain that respondents still feel are mild pain and moderate pain.

**Table 5. Osteoarthritis pain levels in the pre-gymnastic intervention**

| Pain levels   | Frequency (n) | Percentage (%) |
|---------------|---------------|----------------|
| No pain       | 0             | 0              |
| Mild pain     | 27            | 90.0           |
| Moderate pain | 3             | 10.0           |
| Severe pain   | 0             | 0              |
| Intense pain  | 0             | 0              |
| Total         | 30            | 100            |

**Wilcoxon analyse of pain level**

Based on Table 6 below, the results of the Wilcoxon test show that the quality of knee osteoarthritis pain in the elderly before and after exercise is significant. This is based on a p-value of  $0.000 \leq \alpha 0.05$ , which means that there is an influence of elderly exercise on reducing the quality



of knee osteoarthritis pain in the elderly at the Tresna Werdha Budi Sejahtera Banjarbaru social institution.

Table 6. Wilcoxon analysis for pain levels

| Pain levels   | Pre-gymnastic | Frequency | Post-gymnastic | F   | Difference |
|---------------|---------------|-----------|----------------|-----|------------|
| No pain       | 0             | 0         | 0              | 0   | 0          |
| Mild pain     | 0             | 0         | 27             | 90  | 0          |
| Moderate pain | 30            | 100       | 3              | 10  | 27         |
| Severe pain   | 0             | 0         | 0              | 0   | 0          |
| Intense pain  | 0             | 0         | 0              | 0   | 0          |
| Total         | 30            | 100       | 30             | 100 | 27         |

Wilcoxon p-value <0.05; r 0.803

#### 4. Discussions

##### Pain levels caused by osteoarthritis in the elderly before gymnastic intervention

Based on research conducted by researchers, it was found that before giving exercise treatment to 30 respondents, all respondents with osteoarthritis felt moderate pain. Osteoarthritis is a degenerative joint disease (age factor) where the entire structure of the common experiences pathological changes. Osteoarthritis occurs due to a lack of synovial fluid; the cartilage layers rub against each other and wear away at each other, causing the layers to thin and cause pain (Guyton & Hall, 2008).

Joint pain is a symptom of osteoarthritis that can interfere with daily activities. The areas usually affected by osteoarthritis are the joints in the fingers, back, knees and hips (Nugroho, 2008).

##### Pain levels caused by osteoarthritis in the elderly after gymnastic intervention

After the elderly exercise, the quality of respondents' pain decreased from 30 people to 3 people suffering from moderate pain. Another 27 elderly people felt their pain decrease to light after undergoing exercise therapy. The results of this research align with previous research, namely research by Rahmawati and Matoko (2014), that sports activity therapy significantly reduces joint pain and increases muscle strength in elderly people with degenerative joints. Physical exercise will train the body to move so that it can impact the production of joint synovial fluid, which functions as a lubricant and inhibits circulation in the joints, which can cause pain.

##### Wilcoxon analyse for pain levels

Based on the results of this study, it was found that the quality of knee osteoarthritis pain in the elderly before and after exercise was significant. This is based on a p-value <0.05, which means that there is an influence of exercise on reducing the quality of knee osteoarthritis pain in the elderly at the Tresna Werdha Budi Sejahtera Banjarbaru Social Home. This shows that physical activity in the form of exercise can increase muscle strength in the elderly. Physical activity in the form of



elderly exercise is effective for increasing muscle strength in the elderly and can reduce pain and disability. Elderly exercise activities can also increase the production of synovial fluid so that it can improve joint movement in the elderly (Ayu & Warsito, 2012). Another effect of exercise for the elderly is that it can improve blood circulation, reduce hypertension, lower blood sugar levels, and can maintain fitness in the elderly, as well as improve the sleep quality of the elderly (Yulianto, 2015).

## 5. Conclusion

There is a relationship between the effect of elderly gymnastic therapy to reduce osteoarthritis of knee pain suffered by the elderly.

## 6. Conflict of interest

All authors declare no conflict of interest.

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