SEKOLAH TINGGI ILMU KESEHATAN TELOGOREJO

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THE OTAGO EXERCISE PROGRAM AND ELDERLY GYMNASTICS ON FALL RISKS YCHOSOCIAL PROBLEMS IN THE ELDERLY

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Abstract: ***Background:*** *Life expectancy is statistical data that describes the average length of time a person lives in a population. The higher the hope rate for a region or country, the better the health and welfare of its people.*
Objective*: To determine the effectiveness of the OTAGO Exercise Program and Elderly Gymnastics on the risk of falls and psychosocial problems in the elderly.*
Method*: The type of research used is quasi-experimental with a pretest and posttest approach with a control group.*
Results*: Based on the analysis and statistical tests in this study, it can be concluded that the OTAGO Exercise Program and Elderly Gymnastics reduce the risk of falls and psychosocial problems in the elderly.*
Conclusion*: By directing respondents to reduce factors that could worsen the condition, subjects can be taken based on various criteria, not just the elderly, and the number of research respondents can be increased so that there are more.*

Keywords OTAGO exercises; Elderly Gymnastics; Psychosocial

INTRODUCTION

Life expectancy is statistical data that describes the average length of time a person lives in a population. The higher the hope rate for a region or country, the better the health and welfare of its people. Based on data from the World Health Organization (WHO), the life expectancy of the world community in 2018 was 72.5 years. Meanwhile, in Indonesia, people's life expectancy is 71.5 years. Based on the latest data from the Indonesian Central Statistics Agency, the life expectancy of Indonesians in 2019 was 73.3 years for women and 69.4 years for men. This data was obtained from the average life expectancy in each province in Indonesia, totaling 34 provinces. Of the 34 provinces, the life expectancy of the people of the DI Yogyakarta region in 2019 ranks highest for both men and women. Meanwhile, the province with the lowest life expectancy is West Sulawesi.

Even so, the overall life expectancy of Indonesian society has continued to increase over the last 50 years. This situation indicates that the quality of the health and socio-economic status of the Indonesian people has improved.

Based on data from the Indonesian Central Statistics Agency in 2020, in almost five decades, the percentage of elderly people in Indonesia has approximately doubled (1971–2020), namely 9.92 percent (around 26 million people). Apart from that, BPS Indonesia also stated that in 2020, around 24 out of 100

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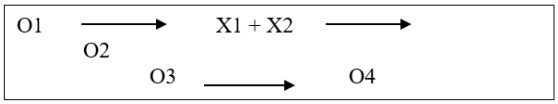
elderly people will experience health complaints. In the last five decades, there has also been an increase in the number of elderly people still actively working: 65.05 percent of men and 38.28 percent of women.

In the elderly, a degenerative process causes a decrease in ability and function and various disorders from a physical and psychosocial perspective. From a physical perspective, one functional ability that decreases is the body's ability to maintain balance, which is necessary for daily activities. Meanwhile, in terms of psychosocial problems, this will give rise to quite complex problems. The most common psychosocial problems that elderly people experience is loneliness, feelings of sadness, depression, and anxiety (Husna & Ariningtyas, 2019). The elderly is also very vulnerable to experiencing stress disorders due to their decreased ability to maintain life, adapt to their environment, and maintain physical and mental function (Hidaayah, 2015). The ability of the elderly to establish social interactions is critical to maintaining the status quo of exchanging ideas. Reduced social interaction in old age can cause feelings of isolation—a feeling of uselessness—so that older people are alone or experience social isolation. It is stated that someone who is elderly will have an increasing feeling of isolation, and this condition is vulnerable to depression (Jamini et al., 2020).

Based on the problems and phenomena described above, the author is interested in conducting research entitled The Effectiveness of the OTAGO Exercise Program and Gymnastics for the Elderly on the Level of Risk of Falls and Psychosocial Problems in the Elderly. This study aimed to determine the effectiveness of the OTAGO Exercise Program and elderly gymnastics against fall risk levels and psychosocial problems in the.

METHODS

The type of research used is *quasi-experimental*, with a pretest-posttest approach with a control group. The following is an overview of the research:



Description:

O1: Initial measurement of fall risk and psychosocial factors (pretest)

X1: Providing Otago exercise.

X2: Elderly Gymnastics

O2: Final measurement of fall risk and psychosocial factors (posttest)

O3: Initial measurement of fall risk and psychosocial problems in the group control without treatment

O4: Final measurement of fall risk and psychosocial problems in the group

SEKOLAH TINGGI ILMU KESEHATAN TELOGOREJO

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At this preparatory stage, it begins with the ethical test permitting process and the permitting process to conduct a preliminary study. The preliminary study begins with a survey.

a. Implementation stage

The data collection stage was carried out for 8 weeks (2 months).

b. Final stage

In the final stage of preparing the report, the data that has been obtained is analysed.

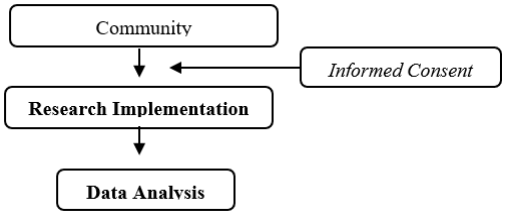

Figure 1. Research Flow

Population dan Sample

Population

The research was conducted at a nursing home located in West Semarang, Central Java. The population in this study was made up of elderly people with a risk of falls and other problems. In the nursing home, there were 40 elderly people.

Sample

The sample is a part of the population that is expected to be representative or representative of the population (Riyanto, 2018). The sample in this study was elderly people at risk of falling who met the inclusion criteria in nursing homes.

Sampling Technique

This research uses a non-random sampling technique using a purposive sampling method, namely a way of taking samples based on certain considerations that have been made by the researcher based on previously known characteristics or characteristics of the population (Riyanto, 2018). Sampling in this study was done by selecting samples based on inclusion and exclusion criteria. The sample criteria for this research are:

1. Inclusion Criteria

Inclusion criteria are general requirements that must be met by subjects in order to be included in the study. The following are the inclusion criteria defined in this study:

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a. Older people aged 65 years or older.
b. Willing to take part in research by filling out informed consent

2. Exclusion Criteria

Exclusion criteria are conditions that cause subjects who meet the inclusion criteria to not be included in the research. Exclusion criteria in this study include:

a. Those not included in the inclusion criteria
b. Volunteers who dropped out (were uncooperative) while the research was underway.

Time and Setting

The research location was carried out at the Nursing Home with the respondents taken being elderly people registered in the area with a research time of 4 weeks..

Data Analysis

The data that has been recapitulated from the results is then analyzed. Data analysis was carried out descriptively to show how the difference in the effect of the Otago Exercise Programme with elderly gymnastics on reducing the risk of falling in the elderly was also tested if the data was normally distributed using the paired t-test or if the data were not normally distributed using the Wilcoxon test

RESULT AND DISCUSSION

This research was carried out in nursing homes from June 1 to June 30. The subjects in this study were elderly people in nursing homes who met the inclusion criteria with a sample of 40 people from a population of 40 people. The type of research used is quasi-experimental, with a pre-and post-test approach by comparing two groups. The first group was group 1, with a total sample of 20 people given the OTAGO exercise, and group 2, with a sample of 20 people given the elderly gymnastics. The purpose of this study was to determine the effectiveness of the OTAGO Exercise Programme and Elderly Gymnastics on the level of risk of falling and psychosocial problems in the elderly.

Table 1. Distribution of Respondents by Age

Age	Group I (OTAGO)		Group II (Elderly gymnastics)	
	Total	Percentage	Total	Percentage
65-70	15	66,6%	10	42.2%
70-75	5	33,3%	10	52,8%
Total	20	100%	20	100%

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Based on Table 1, it can be seen that in group I there were 15 respondents aged 65–70 years (66.6%) and 5 people aged 70–75 years (33.3%), while in group II there were as many as 10 people (50%) and 70–75 years as many as 10 people (50%) in group II

Table 2. Distribution of Respondents Based on Sex

Sex	Group I (OTAGO)		Group II (Elderly exercise)	
	Total	Percentage	Total	Percentage
Male	5	39,6%	8	33%
Female	15	59,4%	12	66,6%
Total	20	100%	20	100%

Based on Table 2, it can be seen that in group I, there were five male respondents (39.6%) and 15 female respondents (59.4%), while in group II, there were eight male respondents (33.3%) and 12 female respondents (66.6%).

Normality Test

The data test used in this research is the Shapiro-Wilk test, which aims to test the normality of the data with the interpretation that if $p > 0.05$, then the data is normally distributed, and if $p < 0.05$, then the data is not normally distributed. Based on the normality test with Shapiro-Wilk, the data for increasing jump height in groups I and II have a p value > 0.05, which means that the data is normally distributed

Influence Test

Based on Table 5 and the results of the paired sample t test in group I who were given OTAGO, a p value of 0.000 was obtained because the results showed a p value of 0.05, meaning that there was an effect of giving OTAGO on reducing pain. Whereas in Table 6, Group II, the p value of 0.035 is obtained because the calculation results show a p value of 0.05, meaning that there is an effect of giving elderly exercise

SEKOLAH TINGGI ILMU KESEHATAN TELOGOREJO

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Effect Difference Test
Table 7. *Independent Sample T-Test*

Variable	Group	Average Difference	*Sig. (2-tailed)*	Conclusion
Fall Risk Reduction	OTAGO / Elderly gymnastics	0,096	0,000	Ha Accepted

Based on Table 7, the results of the different effect tests using the independent sample t-test in the administration of OTAGO and Elderly Gymnastics on the risk of falling decreased by an average of 0.096 between Group I and Group II. Then, for the results of the p-value = 0.000

DISCUSSION

Falls are a common problem for the elderly. More than one-third of the world's population aged 65 years or more, or about 30% of the elderly, falls each year. After age 75, the fall rate increases by up to 50% per year as injuries and deaths increase. Falling in the elderly is one of the leading causes of disability and death. (Ministry of Health, 2017) explains that almost falling is a sudden loss of balance that does not result in a fall or other injury. This case can include someone who slips or trips but can regain control before falling.

Most falls do not result in serious physical injuries, but about 10%–25% do. The risk of injury and death from falls increases with age. Falls are also the most common cause of trauma-related hospital admissions for the elderly.

The Otago Exercise Programme is a set of muscle-strengthening and balance exercises designed to prevent Kelurahanin falls (Campbell et al., 2003). The Otago Exercise Programme aims to improve balance and can help prevent falls. The Otago Exercise Programme is a muscle strengthening and balance program programmed by a physiotherapist with minimum Otago exercises. The Otago Exercise Programme was created and tested by the New Zealand Falls Prevention Research Group.

Otago Exercise Programme in Kelurahanin for the age group of 65 years and over. People of old age interested in maintaining and increasing muscle strength and balance and improving their ability to perform daily activities, or Activities of Daily Living (ADL), can also participate in this program. In addition, an individual who has experienced a fall or has a neuromuscular disorder can also participate in the Otago Exercise Programme.

The Otago Exercise Programme has been tested in four separate test groups in communities in nine cities in New Zealand. Based on the test results, out of 1,061 participants (23% were men) aged between 65 and 97 years, 810 (80% of the total sample) were 80 years of age or older (Campbell et al.,

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2003). In addition, based on the results of research conducted by Campbell, it was found that the Otago Exercise Programme reduced the incidence of falls by 35% and the number of injuries caused by falls by 35%.

Before carrying out the Otago Exercise Programme, it is necessary to carry out several checks that will later become a reference for determining the exercise program, namely the 30-second chair stand test, the four-stage balance test, and the time up-and-go test.

In the training program, four levels are used in the Otago Exercise Programme: A, B, and D, which are described in tabular form. The table lists the exercises from the Otago Exercise Programme that each level's trainees were able to complete after 52 weeks of training (National Centre for Injury Prevention and Control, Division of Unintentional Injury Prevention; United States).

Apart from that, the Otago Exercise Programme also provides a walking training program. The principle of the Otago Exercise Programme itself is to focus on the lower extremities, namely the flexor and knee extensor muscle groups.

Elderly gymnastics is a series of regular movements that involve all muscles and joints and are easy to do (Atikah, 2010; Surati, 2009). Gymnastics consists of movements involving almost all the body's muscles, recreation elements, and a flexible technical implementation that can be done in open or closed spaces.

According to Sumitarsih (2009), the benefits of gymnastics for the elderly are to improve one of the components of physical fitness related to motor skills, namely body balance.

CONCLUSION

Based on the results of the analysis and statistical tests in this study, it can be concluded that there is an effect of the OTAGO Exercise Programme and Elderly Gymnastics on the level of risk of falling and psychosocial problems in the elderly.

The suggestions written by the author based on this conclusion are that researchers can provide direction to respondents to reduce factors that can exacerbate conditions, subjects can be taken with various criteria, not only the elderly, and the number of research respondents can be increased so that there are more.

AUTHOR CONTRIBUTION

The study was designed and conducted with the involvement of all team members who contributed to data collection, analysis, and manuscript preparation. Each author reviewed and approved the final version of the manuscript, ensuring the accuracy and integrity of the research.

CONFLICT OF INTEREST

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The authors declare no conflicts of interest. There were no financial or personal relationships that could have influenced the study's results. The research was conducted independently and all potential conflicts have been disclosed.

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Physiotherapy and Physical Rehabilitation Journal
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Web https://ojs.stikestelogorejo.ac.id/

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SEKOLAH TINGGI ILMU KESEHATAN
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