

DIFFERENCES IN THE INFLUENCE OF CORE STABILITY AND BALANCE TRAINING TRAINING ON THE RISK OF FALLING IN THE ELDERLY

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Abstract

Background of the problem: The aging process causes a decrease in the sensory system, musculoskeletal system, and neurological system which will cause balance disorders and also the risk of falling, to reduce these problems, physical activity must be increased, to improve this there are several exercises such as core stability and balance training. **Research Objectives:** This study aims to determine differences in the effect of core stability training and balance training on reducing the risk of falling in the elderly. **Research Methods:** The research design was two group pre and post test design. **Research Subjects:** The subjects in this study were the elderly who were at risk of falling in the Independent Children's Social Service Institution for the Elderly Social Service "Pucang Gading" who met the inclusion criteria. The number of subjects as many as 30 subjects were divided into 2 groups divided by randomization. Group I was given core stability training and group II was given balance training. Fall risk measurement uses the Time Up and Go Test (TUGT). **Research Results:** The results of different test groups of core stability and balance training post test using the Independent T-Test showed $p = 0.00$ ($p < 0.05$). This shows that there is a difference in the effect of core stability training and balance training on reducing the risk of falling in the elderly. The results of the mean difference in the core stability and balance training groups showed that the core stability group was greater than the balance training group. **Conclusion:** Core stability has more influence on reducing the risk of falling in the elderly than balance training Group.

Keywords: Elderly, Fall Risk, Core Stability, Balance Training

INTRODUCTION

Entering the aging population period, where there was an increase in life expectancy followed by an increase in the number of elderly people, Indonesia experienced an increase in the number of elderly people from 18 million people (7.56%) in 2010, to 25.9 million people (9.7%) in 2019, and is expected to continue to increase in 2035 to 48.2 million people (15.77%). The large number of elderly people in Indonesia in the future will have both positive and negative impacts. It has a positive impact, if the elderly are healthy, active and productive. On the other hand, the large number of elderly people becomes a burden if the elderly have health problems which result in increased health service costs, decreased income/income, lack of social support and an environment that is not friendly to the elderly population (Ministry of Health RI 2017).

According to the Law of the Republic of Indonesia Number 13 of 1998 concerning Elderly Welfare, what is meant by an elderly person is someone who has reached the age of 60 years and over. Elderly is the last stage of the life cycle, which has an impact on decreasing body function and physical capacity due to degeneration and menopause. The degeneration process causes a postural imbalance as a result of sensory deficits such as vestibular hypofunction, and impaired visual acuity and loss of muscle mass which will trigger falls in the elderly (Priyanto, Pramuno, and Rusliyah 2016).

The risk of falling increases if problems with balance disorders in the elderly are not treated immediately. Lack of physical activity is a risk factor for balance disorders. Physical activity consists of activities carried out in leisure time (leisure time physical activity), transportation activities such as walking and cycling, work activities, and physical exercises such as sports and gymnastics (Eko Supriyono 2015). Physiotherapy can provide physical exercises aimed at improving balance and also reducing the risk of falling in the elderly. These exercises can be like Balance Training and Core Stability Exercises.

Balance Training is a physical exercise performed to increase body stability by increasing the strength of the lower limb muscles. In maintaining balance it involves many aspects such as functional strength, flexibility and integration of sensory systems including: visual, vestibular and proprioceptive which provide information to the central nervous system as a processor and passed on to the neuromuscular system as an effector which adapts rapidly to changes in body position and posture (Nugraha, Wahyuni, and Muliarta 2016). Meanwhile, Core Stability is an exercise that can help increase muscle strength in the elderly, consisting of 4 main muscles; including the pelvic floor muscles, abdominal muscles, back muscles, and the diaphragm. These muscles serve as links to the arms and legs for movement of the distal limbs, which affect balance, walking, and daily activities (Sonthikul et al. 2019).

Based on the background that has been described, decreased balance can increase the risk of falling in the elderly. This requires effective training, and more evidence in research. Therefore, researchers want to examine "Differences in the Effect of Core Stability Training and Balance Training on the Risk of Falling in the Elderly".

METHOD

This research is a quasi-experimental research. With the two group pre and post test approach. Researchers divided into 2 groups, group 1 was given treatment with core stability and group 2 was given treatment with balance training. The data were obtained from direct measurements of the elderly by researchers using the time-up-and-go-test (TUGT). The pre test was carried out by measuring the TUGT of each group before being given treatment. The post test is a re-measurement of the TUGT of each group after being given treatment. The intervention was given 3 times/week for 4 weeks.

RESULTS AND DISCUSSION

In this study, there were 30 subjects and met the inclusion criteria, the subject was female. Research subjects were divided into 2 groups. Group I core stability training and group II balance training. Based on the minimum age group of 62 years, the maximum age is 84 years. Then based on a minimum body mass index of 21.48 kg/m², a maximum of 24.64 kg/m². Subject demographics are described in the following table:

SUBJECT CHARACTERISTICS BASED ON AGE AND BMI

	Group I	Group II
Age	62	62
minimum		
maximum	84	82
Average	73,20	71,67
BMI		
minimum	21,482	21,311
maximum	24,646	25,077
Average	23,389	23,403

In this study, characteristics based on age 62-84 years have a strong relationship with the risk of falling. In accordance with age, according to the Ministry of Health of the Republic of Indonesia in 2009 at the age of 60 years and over will experience changes in their activities so that the flexibility they have will decrease and cause a large risk of falling. Based on Supriyono's 2015 research, states that the risk of falling in the elderly is one of the direct effects of balance disorders, increasing age will cause body balance disorders caused by weakness of the lower extremity muscles, these disorders result in slow motion, short footsteps, decreased muscle strength thereby increasing the risk of falling in the elderly.

In this study, the ideal body mass index (BMI) was 8, and 22 people were overweight. Body Mass Index is also one of the factors associated with the risk of falling which is associated with high postural pressure and balance disorders which result in changes in the center of the body mass (COM) (Corbeil et al., 2001).

TUGT PRE AND POST TEST RESULTS OF GROUP I AND II

<i>Group</i>	<i>Means</i>	<i>p-values</i>
<i>Pre class I</i>	10.92	0.000
<i>Post kel I</i>	8,18	
<i>Pre class II</i>	11.93	0.000
<i>Post class II</i>	10.78	

The results of research on the elderly who were at risk of falling before the intervention obtained a TUGT value of 10.92. Then after being given an intervention it became 8.18. It is proven that only 12 treatments (0.000) in core stability exercises provide a significant reduction so that these exercises can reduce the risk of falling in the elderly. Core stability exercises can cause posture adjustments to maintain the point of gravity and sensory input in the form of visual, prosicptive and auditory information which will improve postural control and stabilization of the body. Increasing the ability of the core muscles and postural control can help improve static balance because the body's coordination response becomes more stable to the environment. Optimal activation of the core muscles will produce mobility in the lower extremities (Irfan, 2010).

The results of research on the elderly who were at risk of falling before the intervention obtained a TUGT value of 11.93. Then after being given an intervention it became 10.78. It is proven that only 12 treatments (0.000) in balance training exercises provide a significant reduction so that these exercises can reduce the risk of falling in the elderly. Movement in balance training will produce a series of movements that are carried out to improve postural balance both dynamically and statically to help the brain adjust to signal changes so that the brain itself will be able to adapt to environmental conditions. With an increase in body balance will result in a decrease in the risk of falling (Masitoh, 2013).

DIFFERENCE IN MEAN PRE-TEST AND POST-TEST

	<i>Mean pre-post test</i>	<i>Difference</i>
Group I	2.74	1.59
Group II	1.15	

The results of the difference in the mean pre-test and post-test in groups I and II showed that the mean of group I was 2.74 and that of group II was 1.15. Thus the intervention group I has more influence on the risk of falling in the elderly. Core stability

is designed to improve the ability of the core muscles (abdominal and back muscles) with bilateral coordination techniques. This exercise is useful for stabilizing and generating power at a more dynamically functional pace and coordinating movements. This exercise is also an important component in providing local strength and balance to maximize activities efficiently and reduce the risk of falling (Yundarwati, 2019).

CONCLUSION

The study, entitled "Differences in the Effect of Core Stability and Balance Training on the Risk of Falling in the Elderly" at the Independent Children's Social Service Home "Pucang Gading" Senior Social Service Home Semarang, the number of research subjects who met the inclusion criteria was a total of 30 people and divided into 2 group, group I core stability training and group II balance training. This research was conducted 3 times per week for 4 weeks in November 2022. From the results of the above study, it can be concluded that core stability training and balance training can have a significant effect on reducing the risk of falling in the elderly, but training is more effective for reducing the risk of falling in the elderly is core stability training.

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