
The Difference In The Effect Of Elderly Fitness Exercise And Balance Exercise On Improving Postural Balance Among Participants Of The Elderly Exercise Group At Fajarmulya Community Health Center

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Abstract

Elderly is a part of the stage of human life journey, the elderly is not a disease but is an advanced stage of a life process marked by a decrease in the body's ability to adapt to the environment and a decrease in balance in the elderly. To determine the difference in the effect of elderly gym and balance exercise on improving postural balance. The research design used a pretest and a posttest two group design. 20 elderly people were sampled by purposive sampling. Group 1 fitness exercise for the elderly was carried out 3 times a week for 4 weeks, group 2 was given balance exercise performed 3 times a week for 4 weeks. The measuring tool uses the Time Up and Go Test (TUGT). Before giving the intervention the balance value in groups 1 and 2 experienced a decrease in the highest balance of 27 and the lowest 22. After giving the intervention there was an increase in the balance of group 1, the highest score was 21, the lowest value was 17 and in group 2 the highest 20 was the lowest 15. Hypothesis test got p-value results. <0.05 , which means that there is an effect of giving the intervention and there is a difference in the effect of giving the elderly gym with balance exercise. There is an effect of giving the elderly gym intervention with balance exercise and there is a difference in giving the elderly gym with balance exercise. It is necessary to do research to improve balance in pre-menopausal age and type of work.

Keywords: *Elderly Fitness Gym, balance exercise, Elderly Balance, Time Up and Go Test (TUGT)*

INTRODUCTION

Elderly individuals experience various physiological changes associated with aging, including decreased muscle strength, joint flexibility, and postural balance. These changes can increase the risk of falls, which may negatively affect daily activities and quality of life. The increasing elderly population in Indonesia also makes the prevention of health problems associated with aging an important concern. Therefore, maintaining postural balance through appropriate physical activity is necessary to support functional independence and reduce the risk of falls among older adults.

Postural balance is influenced by the integration of sensory and musculoskeletal systems, including the vestibular, visual, and somatosensory systems. Aging may cause changes in posture, muscle strength, and the body's center of gravity, which can impair the ability to maintain stability (Anggriani & Sulaiman, 2018). Regular and appropriate physical exercise is therefore needed to maintain and improve balance among older adults.

One form of physical activity that can be applied is elderly fitness exercise, which consists of rhythmic and structured movements designed to improve physical functional capacity. This exercise has been reported to improve body control, movement coordination, and both static and dynamic balance among older adults (Rasida, 2017). Another intervention is balance exercise, which specifically aims to improve lower-extremity muscle strength and balance control. Movements such as *plantar flexion*, *hip flexion*, *hip extension*, *knee flexion*, and *side leg raise* can contribute to improved postural stability (Nugraha & Nila et al., 2016).

Previous studies have demonstrated beneficial effects of both interventions on balance. Made, Nila, and I Made (2015) reported a significant improvement in dynamic balance following balance exercise, with a significant difference between the control and intervention groups. Similarly, Ninik and Hartini (2019) found that balance exercise

significantly improved postural balance among older adults, while Rasida (2017) reported significant effects of elderly fitness exercise on static and dynamic balance. These findings indicate that both interventions may be useful for improving postural balance, although their effects may differ.

Based on observations among the elderly exercise group at Fajarmulya Community Health Center, balance problems were identified among participants, with 25 elderly individuals participating in the exercise group. This condition indicates the need for appropriate exercise interventions to improve postural balance and reduce the risk of falls. Therefore, this study aims to determine the difference in the effects of elderly fitness exercise and balance exercise on improving postural balance among participants of the elderly exercise group at Fajarmulya Community Health Center.

RESEARCH METHODS

This study employed a quasi-experimental method with a *pretest-posttest two-group design*. The study aimed to determine the difference in the effects of elderly fitness exercise and balance exercise on improving postural balance among older adults. The study was conducted at Fajarmulya Community Health Center, Fajarmulya District, Pringsewu Regency, Lampung, from June to August 2026.

The study population consisted of 25 elderly members of the Persadia exercise group at Fajarmulya Community Health Center. A total of 20 respondents were selected using purposive sampling based on predetermined inclusion and exclusion criteria. The inclusion criteria were adults aged ≥ 60 years, willing to participate until the end of the study, having a history of falls, being able to communicate well, and experiencing balance problems based on the *Time Up and Go Test* (TUGT). Respondents with lower-extremity injuries, serious acute illnesses, total bed rest, or movement-limiting conditions such as stroke were excluded. The respondents were randomly divided into two groups of 10 participants each. Group I received elderly fitness exercise, while Group II received *balance exercise*.

The interventions were administered three times per week for four weeks. Postural balance was measured before and after the intervention using the Time Up and Go Test (TUGT). In the TUGT, participants were instructed to stand from a seated position, walk 3 meters, turn around, return to the chair, and sit down again. The completion time was measured using a stopwatch. The collected data included participants' characteristics and TUGT results before and after the intervention.

Data were processed through editing, coding, data entry, and cleaning using SPSS. Descriptive analysis was used to describe participants' characteristics, while bivariate analysis was performed to examine changes in postural balance before and after the intervention. Data normality was assessed using the Shapiro-Wilk test. For normally distributed data, the difference between pretest and posttest scores within each group was analyzed using the paired sample t-test. The difference in balance improvement between the two groups was analyzed by comparing the change scores (*posttest-pretest*) using an appropriate statistical test. Statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

This study used a quasi-experimental method with a *two-group pretest-posttest design*. The participants received elderly fitness exercise or *balance exercise* three times per week for four weeks. Postural balance was measured using the *Time Up and Go Test* (TUGT) before and after the intervention. A total of 20 participants were included and divided into

two groups: Group 1 received elderly fitness exercise, while Group 2 received *balance exercise*.

Respondent Characteristics

Table 1. Distribution of Respondents by Age

Age (years)	Group 1 (n=10)	%	Group 2 (n=10)	%
66–70	7	70.0	6	60.0
71–75	3	30.0	4	40.0
Total	10	100	10	100

Note: Group 1 = elderly fitness exercise; Group 2 = balance exercise.

Table 1 shows that most participants in both groups were aged 66–70 years. In Group 1, 7 participants (70.0%) were aged 66–70 years and 3 participants (30.0%) were aged 71–75 years. In Group 2, 6 participants (60.0%) were aged 66–70 years and 4 participants (40.0%) were aged 71–75 years.

Table 2. Distribution of Respondents by Sex

Sex	Group 1 (n=10)	%	Group 2 (n=10)	%
Male	3	30.0	2	20.0
Female	7	70.0	8	80.0
Total	10	100	10	100

Table 2 shows that female participants predominated in both groups. Group 1 consisted of 3 males (30.0%) and 7 females (70.0%), while Group 2 consisted of 2 males (20.0%) and 8 females (80.0%).

TUGT Scores Before the Intervention

Table 3. TUGT Scores Before the Intervention

Measurement	Group 1	Group 2
Mean ± SD (seconds)	24.60 ± 1.506	24.20 ± 1.549
Maximum (seconds)	27	27
Minimum (seconds)	22	22

Table 3 shows that before the intervention, the mean TUGT score was 24.60 ± 1.506 seconds in Group 1 and 24.20 ± 1.549 seconds in Group 2. The maximum and minimum scores were 27 and 22 seconds, respectively, in both groups.

TUGT Scores After the Intervention

Table 4. TUGT Scores After the Intervention

Measurement	Group 1	Group 2
Mean ± SD (seconds)	19.30 ± 1.160	17.30 ± 1.494
Maximum (seconds)	21	20
Minimum (seconds)	17	15

Table 4 shows that after the intervention, the mean TUGT score decreased to 19.30 ± 1.160 seconds in Group 1 and 17.30 ± 1.494 seconds in Group 2. The maximum and minimum scores in Group 1 were 21 and 17 seconds, respectively, while those in Group 2 were 20 and 15 seconds.

Difference in TUGT Scores Before and After Elderly Fitness Exercise

Table 5. Difference in TUGT Scores in Group 1

Measurement	Pretest	Posttest	Difference (seconds)
Mean	24.60	19.30	5.30
SD	1.506	1.337	—

Table 5 shows that the mean TUGT score decreased from 24.60 seconds before the intervention to 19.30 seconds after elderly fitness exercise, with a mean difference of 5.30 seconds.

Difference in TUGT Scores Before and After Balance Exercise

Table 6. Difference in TUGT Scores in Group 2

Measurement	Pretest	Posttest	Difference (seconds)
Mean	24.20	17.60	6.60
SD	1.549	1.494	—

Table 6 shows that the mean TUGT score decreased from 24.20 seconds before the intervention to 17.60 seconds after *balance exercise*, with a mean difference of 6.60 seconds.

Research Hypothesis Testing

Hypothesis testing was conducted to determine the difference in the effects of elderly fitness exercise and *balance exercise* on improving postural balance among older adults using the *paired samples t-test* in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center.

Hypothesis 1 Testing

Table 7. Results of Hypothesis 1 Testing of Time Up and Go Test (TUGT) Scores Before and After Elderly Fitness Exercise in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center

Group	Before (Mean ± SD)	After (Mean ± SD)	Paired Samples t-test (t)	p-value
Group 1	24.60 ± 1.506	19.30 ± 1.160	24.832	0.000

Note:

Group 1: Elderly fitness exercise group.

The results of the *paired samples t-test* on the TUGT scores before and after the intervention showed a p-value of 0.000, which was less than 0.05 ($p < 0.05$). Therefore, H_a was accepted and H_0 was rejected, indicating that elderly fitness exercise had a significant effect on improving postural balance among older adults in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center.

Hypothesis 2 Testing

Table 8. Results of Hypothesis 2 Testing of Time Up and Go Test (TUGT) Scores Before and After Balance Exercise in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center

Group	Before (Mean ± SD)	After (Mean ± SD)	Paired Samples t-test (t)	p-value
Group 2	24.20 ± 1.549	17.60 ± 1.506	13.863	0.000

Note:

Group 2: *Balance exercise* group.

The results of the *paired samples t-test* on the TUGT scores before and after the intervention showed a p-value of 0.000, which was less than 0.05 ($p < 0.05$). Therefore, H_a was accepted and H_0 was rejected, indicating that *balance exercise* had a significant effect on improving postural balance among older adults in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center.

Hypothesis 3 Testing

Table 9 Results of the Paired Samples t-Test for Hypothesis 3 After Elderly Fitness Exercise and Balance Exercise in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center

Group	N	Mean ± SD	Paired Samples t-test (t)	p-value
Group 1	10	19.30 ± 1.160	2.486	0.03
Group 2	10	17.60 ± 1.506		

Note:

Group 1: Elderly fitness exercise group.

Group 2: *Balance exercise* group.

The results of the *paired samples t-test* after the intervention showed a p-value of 0.03, which was less than 0.05 ($p < 0.05$). Therefore, H_a was accepted and H_0 was rejected, indicating that there was a significant difference in the effects of elderly fitness exercise and

balance exercise on postural balance among older adults in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center.

Discussion

Balance disorders refer to the inability of older adults to maintain their center of gravity while in an upright position. Postural balance disorders are commonly experienced by older adults. Balance exercises can improve the quality of life of older adults. This is consistent with Hewitt, Refshauge, Goodall, Henwood, and Clemson (2014), who reported that balance exercises performed by 300 older adults over six months in Australia had a significant effect on the quality of life of elderly residents. The decline in quality of life associated with aging can be improved through such exercises. Santos, Dantas, and Moreira (2015) also reported that an exercise program that included balance exercises, performed by 323 older women with a mean age of 69 years, improved quality of life by 9.19% ($p = 0.001$).

Based on the results of the study conducted among 20 participants in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center, the participants were divided into two groups, with 10 participants in each group. Each group received a different intervention. Group 1 received elderly fitness exercise, while Group 2 received *balance exercise*. Before the interventions were administered, the participants were assessed using the *Time Up and Go Test* (TUGT), which is an instrument for measuring balance in older adults. The TUGT procedure involves asking the participant to sit on a chair with the back supported, with the chair height adjusted to the participant's height. The knees are positioned at approximately 90° flexion, and the arms rest comfortably. The participant then stands up, walks 3 meters (10 ft), turns around, walks back to the chair, and sits down with the back supported. The time is measured using a stopwatch, starting when the participant begins to stand and ending when the participant sits back down. Participants may wear footwear and use an assistive device if necessary, but assistance from another person is not permitted (Khusnul, 2014).

The results of the *Time Up and Go Test* (TUGT) before the elderly fitness exercise and *balance exercise* interventions showed that Group 1 had a highest score of 27 seconds and a lowest score of 22 seconds, while Group 2 also had a highest score of 27 seconds and a lowest score of 22 seconds. The TUGT was also administered after the elderly fitness exercise and *balance exercise* interventions. Group 1 obtained a highest score of 20 seconds and a lowest score of 16 seconds, while Group 2 obtained a highest score of 19 seconds and a lowest score of 15 seconds. These results indicate an improvement in postural balance among the participants after receiving the elderly fitness exercise and *balance exercise* interventions, as measured using the *Time Up and Go Test* (TUGT).

Elderly fitness exercise was administered to Group 1, while *balance exercise* was administered to Group 2. A difference in the effects of the two interventions was observed based on the pretest-posttest differences. Group 1, which received elderly fitness exercise, showed a difference of 5.3 seconds, while Group 2, which received *balance exercise*, showed a difference of 6.6 seconds. Thus, there was a difference of 1.3 seconds between the two groups, indicating a greater improvement in TUGT performance in the *balance exercise* group.

The elderly fitness exercise intervention was administered to the Persadia Elderly Exercise Group at Fajarmulya Community Health Center for four weeks, three times per week. Before and after the intervention, the participants were assessed using the *Time Up and Go Test* (TUGT). According to Muhidin (2015), elderly fitness exercise includes movements that contribute specifically to postural control by stimulating the musculoskeletal, sensory, and cognitive systems through controlled and coordinated movements. Based on the results of the normality analysis, the Group I pre-intervention data obtained a p-value of 0.886, while the post-intervention data obtained a p-value of 0.328. In

Group II, the pre-intervention data obtained a p-value of 0.668, while the post-intervention data obtained a p-value of 0.080. Therefore, the p-values before and after the intervention in both groups were greater than 0.05 ($p > 0.05$), indicating that the data were normally distributed. Thus, parametric statistical analysis was used, and the *paired samples t-test* was applied to test Hypotheses 1 and 2. Based on the Shapiro-Wilk normality test, the difference between the pretest and posttest scores was analyzed using the parametric *paired samples t-test*. The test resulted in a p-value of 0.000 ($p < 0.05$), indicating that elderly fitness exercise had a significant effect on improving postural balance among older adults in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center.

The *balance exercise* intervention was administered to the Persadia Elderly Exercise Group at Fajarmulya Community Health Center for four weeks, three times per week. Before and after the intervention, participants were assessed using the *Time Up and Go Test* (TUGT). According to Nugraha (2016), *balance exercise* is a form of physical activity designed to improve body stability and proprioception, which provides information regarding movement precision and muscular reflexes that contribute to dynamic joint stability. Good joint stability helps maintain balance. Based on the results of the parametric analysis using the *paired samples t-test*, a p-value of 0.000 was obtained ($p < 0.05$). This indicates that *balance exercise* had a significant effect on improving postural balance among older adults in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center. These findings are consistent with the study by Listyarini and Alvita (2018), which reported a p-value of 0.000 ($p < 0.05$) in the experimental group and 0.317 ($p > 0.05$) in the non-experimental group. The study concluded that *balance exercise* had an effect on the experimental group, while no significant effect on body balance was observed in the non-experimental group in Singocandi Village, Kudus.

The results of Hypothesis 3 testing used the *paired samples t-test* because the data were considered paired. The results of the *paired samples t-test* on the TUGT scores showed a p-value of 0.03, which was less than 0.05 ($p < 0.05$). Therefore, H_a was accepted and H_0 was rejected, indicating that there was a difference in the effects of elderly fitness exercise and *balance exercise* on postural balance among older adults in the Persadia Elderly Exercise Group at Fajarmulya Community Health Center. These findings are consistent with the study by Nugraha and Nila M.H.S. et al. (2016), which reported that the mean dynamic balance score in the *balance exercise* training group was 44.28 at the pretest and increased to 45.43 at the posttest, with a mean difference of 1.143. The increase in dynamic balance scores was statistically tested using the *paired samples t-test*, which showed a p-value of < 0.05 . This indicates a statistically significant difference in dynamic balance scores in the *balance exercise* training group.

Based on the research data obtained from the Persadia Elderly Exercise Group at Fajarmulya Community Health Center, both elderly fitness exercise and *balance exercise* had an effect on postural balance among older adults, as measured before and after the interventions using the *Time Up and Go Test* (TUGT). All participants showed improvement in balance after receiving the interventions for four weeks, with three sessions per week conducted regularly and continuously. However, the degree of improvement in balance varied among the participants.

This study encountered several obstacles during its implementation. One of the main challenges was that some older participants could not immediately understand the purpose and procedures explained by the researcher. In addition, differences in the physical condition and abilities of the participants affected their capacity to perform the physical activities or interventions provided by the researcher. These factors presented challenges throughout the research process. To minimize these difficulties, the researcher repeatedly explained the procedures using simple and familiar words. The researcher also provided motivation to the

participants before and after each exercise session. Establishing a close and supportive relationship between the researcher and participants was also considered important. These approaches were implemented to ensure that the research could be conducted effectively and achieve optimal results.

CONCLUSION

Based on the results of the study entitled “The Difference in the Effects of Elderly Fitness Exercise and Balance Exercise on Improving Postural Balance among Participants of the Persadia Elderly Exercise Group at Fajarmulya Community Health Center,” it can be concluded that elderly fitness exercise had a significant effect on improving postural balance among older adults after the intervention, with a p-value of 0.000 ($p < 0.05$), indicating that H_a was accepted and H_0 was rejected. Similarly, *balance exercise* had a significant effect on improving postural balance among older adults, with a p-value of 0.000 ($p < 0.05$), indicating that H_a was accepted and H_0 was rejected. Furthermore, there was a significant difference in the effects of elderly fitness exercise and *balance exercise* on improving balance among older adults, with a p-value of 0.03 ($p < 0.05$), indicating that H_a was accepted and H_0 was rejected.

For older adults, it is recommended to increase regular physical activity and perform the exercises provided by the researcher to help maintain and improve balance. Older adults may choose the type of exercise according to their preferences. Those who prefer to exercise individually at home may perform *balance exercises* under appropriate supervision, while those who prefer group activities may participate in elderly fitness exercise sessions. For healthcare practitioners, the findings of this study can serve as a reference for the Medical Rehabilitation Team in providing services for older adults experiencing decreased balance. *Balance exercise* can be provided as an individual exercise program that may be performed at home under supervision, while elderly fitness exercise can be incorporated into health education activities at community health centers or integrated health posts involving groups of older adults. Further research is recommended to examine balance improvement among premenopausal women and in relation to different types of occupations.

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