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Influence Chair Yoga Exercise on Decreasing the Risk of Falls for the Elderly

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Abstract

Falls are a significant concern among the elderly, often leading to injury, disability, and reduced quality of life. This study aims to examine the influence of chair yoga exercises on reducing the risk of falls among residents at St. Joseph's Nursing Home, Kediri. Using a pre-experimental one-group pretest-posttest design, this research assessed fall risk levels before and after a structured chair yoga intervention. The study employed the Timed Up and Go Test (TUGT) to measure fall risk, with data analyzed using paired t-tests to determine the effectiveness of the intervention. The results demonstrated a significant decrease in fall risk scores following the chair yoga program, highlighting its efficacy in enhancing balance and physical stability among participants. The findings suggest that incorporating chair yoga into daily routines can serve as a practical and accessible strategy for fall prevention in elderly populations. This study contributes to the growing body of evidence supporting yoga-based interventions as a non-pharmacological approach to improving the health and well-being of older adults in nursing care settings.

Introduction

The aging process is a natural part of the life cycle that no one can avoid. As we age, changes occur in a person's physical and mental condition, which are often accompanied by a decrease in function and capacity. When they reach old age, most elderly people automatically reduce their daily activities, which will ultimately affect their quality of life (Meiyanti et al., 2022).

Elderly is a period of biological aging accompanied by a decrease in muscle mass. One of the problems that arise due to a decrease in muscle mass is fatigue when moving, short steps, feet not landing firmly, being easily swayed, and being slow to anticipate disturbances, such as slipping, tripping, or sudden events, which cause falls easily. Although falls are not a normal part of aging, approximately 30% of adults fall each year (Suciana et al., 2018).

In the elderly, many physical changes occur, especially because the body's tissues become less strong to carry out the functions of the musculoskeletal and neurological systems. In this case, the number and ability of body cells decreases with age (Ekasari et al., 2019).

According to Susenas data for March 2022, 16.09 percent of the population is over 65 years old, or 10.48 percent of the total population. This indicates that each elderly person needs the help of around 6 people aged between 15 and 59 years who are still working. There are more elderly women than elderly men (51.81 percent compared to 48.19 percent), and more elderly

people live in urban areas than in rural areas (56.05 percent compared to 43.95 percent). Young elderly (60-69 years) cover 65.56 percent of the elderly population, medium elderly (70-79 years) cover 26.76 percent, and old elderly (80 years or more) cover 7.69 percent (BPS, 2020).

Elderly people experience several changes as they get older. The physical problem that elderly people often experience is falls. With altered physiological functions, elderly people are at risk of falling due to disturbances and decreased balance. Body balance, which is very important for controlling posture, helps maintain balance to prevent falls (Astari, 2023). Falls can result in various kinds of complications ranging from the mildest such as bruises or sprains (Fauziah, 2019). Further complications due to falls can cause death (Murtiyani & Suidah, 2019).

Falls among older adults are a growing concern globally, contributing significantly to injury, long-term disability, increased healthcare utilization, and even mortality rates. Identifying risk factors through comprehensive medical assessments is essential for implementing effective interventions to reduce fall incidents (Guirguis-Blake et al., 2018). As a leading cause of premature institutionalization and disability, falls require targeted strategies to address their root causes (Montero-Odasso et al., 2022).

Maintaining body balance is critical in preventing falls and related injuries, particularly for individuals aged 65 and older. Yoga-based interventions have shown promise in enhancing balance and physical health. Participants engaging in yoga experience lower body fat, higher muscle mass, and improved balance compared to non-practitioners. Moreover, yoga practice may support protein utilization and help preserve muscle mass in older women, counteracting the common effects of aging-related muscle loss (Colletto & Rodriguez, 2018).

Chair Yoga Exercise (CYE) effectively improves fitness (Yao & Tseng, 2019), reduced anxiety and depression, and improved mood, after attending a chair yoga session (Nanthakumar, 2020), and reduce the fear of falling (Furtado et al., 2016). Another study reported that yoga for 4 weeks, done 3 times a week, resulted in changes in the level of body balance in elderly people (Arik et al., 2023). Balance refers to the body's ability to maintain stability and proper posture, particularly while standing. This aligns with Bafirman & Wahyuri (2019) definition of balance as the capacity to sustain a correct body position during static activities.

Several factors influence balance, including visual input, inner ear function (cochlear system), and physical attributes such as agility (Oktavian & Syaifullah, 2022), core muscle endurance (Ferriyani et al., 2021), speed, leg muscle strength (Oktavian, 2023). Balance in the elderly can be improved with several types of exercise such as yoga (Loewenthal et al., 2023), hatha yoga (Arik et al., 2023), or by Chair Yoga Exercise (Frampton et al., 2024).

Based on observations made at the St Josep Nursing Home in Kediri, the problems faced by the elderly include worry about falling and the high risk of falls among the elderly, which can have serious impacts, especially in the nursing home environment. In the last 6 months, 12 people were recorded as having fallen when waking up, 4 people fell while walking and 2 people suffered fractures due to falls which resulted in them having to move around in a wheelchair. Through a review of the literature, it has been discovered that yoga, incl Chair Yoga The adapted program can meet the needs of the elderly at St Yosef nursing home because it can be done safely and comfortably to improve balance, flexibility and muscle strength, thereby reducing the risk of falls. From the description of the problem above, the researcher is interested in proving empirically regarding: the effect of giving Chair Yoga Exercise on reducing the risk of falls in the elderly at the St Josep Nursing Home in Kediri.

Methods

This research is pre-experimental research. Research design refers to one group pretest-posttest. Researchers gave a pre-test on the risk of falling to a number of respondents who would be given treatment. Then the researcher carried out treatment in the form of: Chair Yoga

Exercise. After completing the treatment, the researcher gave a fall risk post-test, the design of which was described as follows:

THE_1 X_1 THE_2

Information:

THE_1 : *Pre test* (risk of falling)

X_1 : *Chair Yoga Exercise*

THE_2 : *Post test* (risk of falling)

This research will be carried out at the St Josep Nursing Home in Kediri from June to August 2024, with an intervention duration of 8 weeks.

The data source in this research is primary data, which was obtained or collected directly by researchers from the elderly at the St Josep Nursing Home in Kediri. The target population was the elderly at the St Josep Nursing Home in Kediri during the research. Researchers use methods *purposive sampling* namely, respondents were obtained from criteria determined by the researcher. The sample in this study is people who meet the inclusion criteria and exclusion criteria: (in the thesis there is no need to mention the number of samples, because it has not been done yet) :

Inclusion Criteria

Respondents are elderly people at the St Josep Nursing Home in Kediri.

Respondents aged 60 - 75 years

Respondents are willing to follow and fill out the respondent form

Respondents with a light fall risk (15-19 seconds)

Exclusion Criteria

Injured responders

Respondents who have a history of vertigo

Have other conditions such as dementia that do not allow the elderly to participate *Chair Yoga Exercise*.

Drop Out

Respondents did not follow research procedures

Respondents withdrew from the study

Chair Yoga Exercise is an intervention consisting of a series of yoga exercises carried out using a chair as a tool, including body movements, breathing and meditation. Fall risk is the possibility of a fall accident in the elderly, which is measured based on the number of falls in a certain time period.

Intervention consisting of a series of yoga exercises carried out using a chair as a tool, including body movements, breathing and meditation given to the elderly. *Chair Yoga Exercise* given equally to each respondent with a frequency of 2 times a week for 8 weeks. Reduction in the likelihood of a fall accident in the elderly, which is measured based on the number of falls in a certain time period. Fall risk is measured by the Timed Up and Go Test (TUGT). Seniors are individuals aged 60-74 years who do not have severe cognitive impairment that prevents participation in the program *Chair Yoga Exercise* and lives at the St Josep Nursing Home in Kediri.

Each research outcome is analyzed by calculating the frequency distribution based on univariate objective criteria. Subsequently, bivariate analysis is performed to assess the relationships between variables. This analysis focuses on examining correlations between independent and dependent variables, utilizing SPSS software with a significance threshold of $p < 0.05$ via a computer-based statistical program. The data analysis process includes explaining the characteristics of each research variable. Descriptive analysis is employed to generate frequency and percentage distributions. Bivariate analysis is then conducted to evaluate interactions between two or more variables believed to have an influence. For examining the impact of multiple independent variables, additional steps are undertaken to build and refine analytical models during the bivariate analysis process.

Before the influence test is carried out, the data normality test is first carried out with *Shapiro-Wilk*. If the data is normally distributed, then an influence test is carried out with *paired t test*, On the other hand, if the data is not normally distributed, then an influence test is carried out with *Wilcoxon test*. Data analysis was used to find the influence of each independent variable and the dependent variable using SPSS version 26.

Result and Discussion

General Characteristics of Research

This research is pre-experimental research. The research design refers to one group pretest-posttest. This research was carried out at the St Josep Nursing Home in Kediri from June to August 2024, starting with sample collection to examine post-intervention variables.

Table 1. Subject Characteristics

Subject Characteristics	n	%
Gender		
Woman	16	100,0
Amount	**16**	**100,0**
Age Group		
60-69 years old	7	43,7
70-79 years old	9	56,3
Amount	**16**	**100,0**

Table 1 shows the characteristics of the respondents based on gender, all of them are women, while based on age the majority are 70-79 years old.

Presentation of research results

Table 2. Risk Of Falls In The Elderly Before And After Intervention

Differences in pre test and post test scores	n	Mean	SD	p-value
Risk of falls before intervention	16	11,56	1,034	0,000
Risk of falls after intervention	16	8,39	0,998	
Difference between pre test and post test	16	3,16	0,874	

Based on table 2, it can be explained that the Chair Yoga Exercise obtained a pretest fall risk score of 11.56 and a posttest of 8.39, with a change of 3.16, this shows significant improvement.

The Wilcoxon test results obtained a p value = 0.000 <0.05. This means that providing Chair Yoga Exercise has a significant effect on changes in the risk of falls in the elderly.

Based on the Wilcoxon test, the value of p = 0.000 (p<0.05), with a pretest value for fall risk of 11.56 and a posttest value of 8.39, with a change of 3.16, which means there is an effect of giving *Chair Yoga Exercise* on changes in the risk of falls in the elderly at the St Josep Nursing Home in Kediri.

Chair yoga exercises are a safe and effective intervention to reduce the risk of falls in the elderly. Research has shown that chair yoga can promote improvements in static, dynamic and total balance scores, all of which are important factors in preventing falls. Additionally, Chair yoga has been shown to reduce fear of falling, which is a significant psychological barrier to physical activity among older adults (Ko et al., 2023; Van Puymbroeck et al., 2017).

Chair yoga is also useful in improving strength, balance and flexibility among the elderly. Regular chair yoga exercise has been proven to reduce joint pain and improve the physical abilities of the elderly, allowing them to maintain independence and carry out daily activities (Furtado et al., 2016); (Kertapati et al., 2018).

This research is in line with research by (Keay et al., 2018; Krejčí et al., 2022) who stated that yoga by following a regularly determined schedule can increase the body's balance level thereby reducing the risk of falls. This research is also in line with research by (Jeter et al., 2014; Smith et al., 2017) who stated that the Yoga Chair program showed improvements in elderly people who were afraid of falling.

Providing Chair Yoga Exercise to the elderly at St. Josep Kediri has a positive influence in reducing the risk of falls. This exercise can help improve body strength and balance, as well as increase flexibility. The movements in the Chair Yoga Exercise can also increase body awareness, so that seniors will be more aware of their surroundings and can avoid falls. Thus, Chair Yoga Exercise can be an effective method in preventing the risk of falls in the elderly at St. Josep Kediri, and improve their quality of life.

Conclusion

Based on the research objectives and the results of the research analysis, it can be concluded that: There is an effect of providing Chair Yoga Exercise on reducing the risk of falls in the elderly at the St Josep Nursing Home in Kediri. The risk score for falls in the elderly before the Chair Yoga Exercise at the St Josep Nursing Home in Kediri was 11.56. The risk score for falls in the elderly after Chair Yoga Exercise at the St Josep Nursing Home in Kediri was 8.39. The fall risk score before and after the Chair Yoga Exercise was in the low fall risk category (<14 seconds).

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