



Analysis of Factors Related To The Risk of Sarcopenia In The Elderly At Stw Ria Development Cibubur

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Abstract

Background: Background: Sarcopenia is a condition associated with the aging process, characterized by a decrease in muscle mass and muscle weakness that develops gradually. Research on sarcopenia in Indonesia is still very limited, but according to the literature, the prevalence of sarcopenia in Indonesia varies between 9.1% to 59%. This high prevalence indicates the need for research on risk factors for sarcopenia. **Objective:** This study aims to analyze the factors associated with the risk of sarcopenia in the elderly at STW Ria Pembangunan Cibubur.

Methodology: The design used is a non-experimental quantitative research design with a cross-sectional approach and a non-parametric statistical approach.

Results: The results of the analysis show that there is a significant relationship between nutritional status which has a risk of malnutrition in 28 respondents (40.6%) and the risk of sarcopenia, namely a p-value of 0.000 and there is a significant relationship between physical activity and the risk of sarcopenia with Min 50 and Max values. 288. Mean physical activity value 131.96 and median 125. Std.Dev 54.360 with a very small pvalue (smaller than 0.05) in the Wilcoxon test at STW Ria Pembangunan Cibubur.

Conclusion: There is a relationship between nutritional status and physical activity on the risk of sarcopenia in the elderly at STW Ria Pembangunan Cibubur. It hope to input the sarcopenia material into learning cases and teaching and learning processes

Keywords:

Physical Activity, Risk of Sarcopenia, Nutritional Status.

Introduction

According to the World Health Organization (2022), the world's aging population is growing rapidly. In 2020, the number of people aged 60 and over worldwide reached 1 billion. It is estimated that this figure will rise to 1.4 billion by 2030, or one in six people in the world. By 2050, the number is predicted to double to 2.1 billion. Additionally, the number of people aged 80

and over is expected to triple from 2020 to 2050, reaching 426 million. Based on data from the World Health Organization (WHO) in 2013, the elderly population in 1950 only reached 202 million people. However, this number quadrupled to 841 million people in 2013. It is estimated that by 2050, the number will triple again to around 1.5 billion, which is equivalent to 16% of the world's total population. Research on sarcopenia in



Asia shows significant variations in prevalence among older people, depending on age. In Asia, the prevalence of sarcopenia varies between 6.7% to 56.7% in men and 0.1% to 33.6% in women (Limpawattana et al., 2015). In China, the prevalence of sarcopenia in the elderly was recorded at 9.8% (Gao et al., 2015). In Southeast Asia, studies on sarcopenia have mainly been conducted in Thailand and Singapore.

Research in Thailand identified a sarcopenia prevalence of 35.33% in men and 34.74% in women (Pongchaiyakul et al., 2013). Indonesia will face significant demographic changes with the increasing number of elderly people. Data from the Central Statistics Agency (BPS) shows that the proportion of people aged over 65 years is expected to increase by 25 percent in 2050. The number is predicted to jump from 25 million people in 2019 to 80 million people in 2050 (Central Statistics Agency for Advanced Age 2019). BPS also estimates that the number of elderly people in Jakarta will continue to increase every year. In 2020, the number of elderly people in the capital city reached 942.8 thousand and is expected to increase to 1.1 million in 2023 and 1.17 million in 2024. BPS estimates that the number of elderly people in Jakarta will reach 1.2 million in 2020. 2025. Research on sarcopenia in Indonesia is still limited and often only covers small areas, without nationally representative data. From various existing studies, the prevalence of sarcopenia in Indonesia varies between 9.1% to 59%. In 2020, around 9.92% of the elderly population in Indonesia, which amounted to 26.82 million people, showed this figure and it is estimated that it will continue to increase. Given the relatively high prevalence and increasing trend, it is important to

understand sarcopenia to improve the quality of life of the elderly and prevent the risk of sarcopenia in the future (Vitriana et al., 2016).

As people get older, their muscle mass decreases. A decrease in muscle mass which is also accompanied by a decrease in muscle strength is known as "Sarcopenia". This condition is associated with aging and can result in a variety of negative outcomes, including risk of falls, disability, need for hospital care, placement in long-term care, reduced quality of life, and death. This shows the importance of sarcopenia in health care for the elderly. Asia itself has a large population, as well as the elderly. The Asian Working Group for Sarcopenia (AWGS) aims to promote Sarcopenia research. Sarcopenia is defined as a condition characterized by low muscle mass, as well as reduced muscle strength and/or reduced physical abilities and also recommends outcome indicators for further research, as well as conditions in which sarcopenia should be assessed. There are various factors that can cause the risk of sarcopenia in the elderly, such as age, genetics, aging, lifestyle, nutrition, changes in body condition, chronic diseases. Among the risk factors that influence the most is nutrition as seen from nutritional status and lack of activity. Lack of nutrition will result in malnutrition. Malnutrition is a nutritional condition characterized by a deficiency, excess, or imbalance of energy, protein, and other nutrients. This condition can negatively impact tissue, body shape, and function and clinical outcomes. Lack or excess of nutrition can cause sarcopenia. Recent research shows that patients who are malnourished have an approximately three to four times greater risk of developing sarcopenia compared to those who are not experiencing malnutrition.

Although sarcopenia often occurs in elderly people, this condition can also arise due to inflammation that causes muscle damage, decreased mobility, and malnutrition (Holdoway, 2021). According to the World Health Organization (WHO) in 2024, physical activity is defined as any body movement that involves skeletal muscles and requires energy. Physical inactivity has been recognized as one of the four main risk factors contributing to global mortality, contributing to 6% of deaths worldwide. Good physical activity in sarcopenia can reduce apoptosis, reduce oxidative stress, anti-inflammatory, increase insulin-glucose dynamics, increase the quality and quantity of muscle protein and mitochondria, skeletal muscle hypertrophy, positive neuromuscular adaptation, and increase muscle blood supply (YC Ko et al., 2021). One of the care facilities for the elderly is Sasana Tresna Werdha (STW). STW provides a variety of services, including physical care, emotional support, social care and protection to ensure seniors can live a good quality of life. One of the STWs in Jakarta is STW Ria Pembangunan Cibubur. Based on observations made by researchers at STW Ria Pembangunan Cibubur in May 2024, it was found that there were 69 elderly people aged 60 years and over. Researchers then conducted an initial study by interviewing 15 elderly people from this group. The results of the interview showed that it was found that elderly people carried out activities or events only in the STW Ria Pembangunan Cibubur area. During initial observations, researchers assessed nutritional status using the MNA questionnaire.

Data was obtained on 1 out of 15 elderly people with normal nutritional status, 6 out of 15 elderly people at risk of malnutrition

and 8 out of 15 elderly people malnourished. Meanwhile, for physical activity, the Activity Scale for the Elderly (PASE) questionnaire was carried out. The data obtained was that 13 out of 15 elderly people were less active. Sarcopenia risk assessment can be carried out through interviews using the SARC-F questionnaire, which consists of five questions related to the risk of sarcopenia in the elderly. These questions cover aspects such as muscle strength, walking ability, ability to get up from a chair, ability to climb stairs, and risk of falls. Based on data obtained from the SARC-F questionnaire, 8 out of 15 elderly people were categorized as being at risk of sarcopenia with a score of ≥ 4 , while 7 out of 15 elderly people were not. at risk of sarcopenia with a score < 4 .

Methods

According to Silaen (2018), research design is an overall plan that includes planning and implementing research. In this research, a non-experimental quantitative design with a cross-sectional approach and a non-parametric statistical approach was used. According to Sugiyono (2019), quantitative research is a method that is based on the philosophy of positivism and is used to collect data from a population or sample by utilizing quantitative or statistical tools. The aim is to analyze the factors associated with the risk of sarcopenia in the elderly at STW Ria Pembangunan Cibubur. In this study, the population studied included all patients at STW Ria Pembangunan Cibubur, totaling 69 people. This population includes the elderly who live in STW and elderly who attend day care. This technique was chosen because the population studied was less than 100 people.

Research Instruments

The instrument used in this research was the

SARCF questionnaire to determine the risk of sarcopenia. Mini Nutritional Assessment (MNA) to determine nutritional status and the Physical Activity Scale for the Elderly (PASE) questionnaire to determine the degree of physical activity. The SARC-F questionnaire includes an evaluation of muscle strength, walking ability, ability to get up from a chair, ability to climb stairs, and risk of falls. A person is categorized as having sarcopenia if they get a SARCF score ≥ 4 . This questionnaire has been recommended by the European Working Group on Sarcopenia in Older People (EWGSOP). Mini Nutritional Assessment (MNA) to determine nutritional status. This questionnaire consists of 6 questions, including: food intake in 3 months weight loss during the last 3 months, mobility, psychological stress or serious illness in the last 3 months, neuropsychological disorders, Body Mass Index (BMI) or measuring calf circumference. It is categorized as malnourished if the screening result is 0-7. Risks of malnutrition 8-11 and 12-14 are

categorized as Normal Nutrition. This questionnaire was first published in 1994 by Guigoz and the latest version was developed in 2009 (Kaiser et al., 2009). Physical Activity Scale for the Elderly (PASE) questionnaire to determine the degree of physical activity in elderly patients. (PASE) is a simple instrument given to individuals aged 65 years and over to measure and provide a score regarding their level of physical activity. This instrument consists of self-reported work, household, and leisure activity items over a one-week period and can be administered by telephone, mail, or face-to-face. The PASE assessment is derived from physical activity measured by counting movements from electronic physical activity monitors, activity diaries, and self-assessed activity levels in the general population of noninstitutionalized older adults. PASE can be used to assess physical activity levels in epidemiological surveys of older people as well as to evaluate the effectiveness of exercise interventions. The questionnaire used was adopted from the New England Research Institutes.

Results

Table 1 Results of Distribution of Respondents' Demographic Characteristics

Variable	Frekuensi	Percentage (%)
Age		
60-69 Years	4	5,8
70-79 Years	37	53,6
>79 Tahun	28	40,6
Gender		
Male	19	27,5
Women	50	72,5
Total	69	100
Risk Of Sarcopenia		
Risk Of Sarcopenia	31	44,9
No Risk Of Sarcopenia	38	55,1
Total	69	100
Nutritional Status		
Malnutrition	16	23,2
Risk Malnutrition	28	40,6
No Risk	25	36,2
Total	69	100

Tabel 2. Relationship between nutritional status and risk of sarcopenia

		Sarkopenia				Pvalue	
		Risk	%	No Risk	%	Total	%
Nutrition	Malnutrition	16	100	0	0	16	100
	Risk	15	53,6	13	46,6	28	100
	Malnutrition						0,000
	Normal	0	0	25	100	25	100
	Total	31	44,9	38	55,1	69	

The data shows that 16 respondents experienced malnutrition (23.3%), 28 respondents were at risk of malnutrition (40.6%) and 25 respondents (36.2%) were not at risk at STW Ria Pembangunan Cibubur. This research was carried out through the MNA questionnaire, data produced by respondents who were at greater risk of malnutrition. In research conducted by Wardhana et al. (2019), The causes of malnutrition in the elderly are multifactorial. Components of the MNA include an assessment of food intake in the last three months, weight loss during the same period, mobility, psychological stress or serious illness that occurred in the last three months, neuropsychological disorders, as well as Body Mass Index (BMI) or calf circumference measurements. Therefore, in detecting sarcopenia, nutritional status is an important factor that needs to be evaluated. Tirtadjaja et al.'s research. (2021) Differences in adequacy of nutritional intake show that elderly people who have inadequate nutritional intake are more often found in the sarcopenia group. This finding is in line with previous research which revealed that nutritional problems are one of the factors causing sarcopenia in the elderly. Nutrient deficiencies can cause significant reductions in strength and muscle mass. Based on the results, nutritional status has a very important role in the risk of sarcopenia. Nutritional status with risk of malnutrition is

more common in STW Ria Pembangunan Cibubur. The way food is served, the taste and the meal times are almost always the same every day can make elderly people quickly feel bored, which in turn can reduce their appetite.

Based on the research results, data obtained from respondents on physical activity had a Min value of 50 and a Max value of 288. The mean value of physical activity was 131.96 and the median was 125. Std.Dev 54.360 at STW Ria Pembangunan Cibubur. Physical activity also has an important role in preventing a decrease in muscle mass. Research conducted by Aryana and Njoto (2023) Physical inactivity in the elderly is the main factor that causes a decrease in function and muscle mass. Therefore, physical exercise is very important to improve muscle strength and physical function. In research conducted by Lee-Szu et al. (2018) showed that increasing physical activity is an effective protective strategy for sarcopenia, as increasing physical activity can lead to increased muscle mass and muscle strength. And participating in leisure activities can also improve musculoskeletal status.

Based on the results of research on the characteristics of respondents, less active physical activity respondents were more often found in STW Ria Pembangunan Cibubur. Some elderly people who have limited ability

to walk gather to take part in the activities provided at Werdha or gather with other Werdha residents. So some elderly people do more activities in their rooms. According to research conducted by Wardhana et al, (2019) there is a significant relationship between nutritional status and the risk of sarcopenia. Where the research shows that the prevalence of sarcopenia increases as the age of the group increases. Apart from that, according to Tirtadjaja et al, (2021) nutrition plays an important role in the incidence of sarcopenia, where in this study nutritional problems such as lack of appetite and lack of protein intake caused a decrease in muscle mass. Most of the research subjects experienced nutritional deficiencies. Around 81.25% of elderly people do not get adequate calorie intake, while 87.5% of elderly people get protein intake below the minimum recommended limit.

Meanwhile, according to research by Okuno et al. (2022) there is no correlation between nutritional status and risk of malnutrition with sarcopenia measurements. This is not in line with the research results obtained by researchers regarding the relationship between nutritional status and the risk of sarcopenia. Based on the results of theoretical analysis and explanations, researchers believe that nutritional status plays an important role in the risk of sarcopenia. There are many studies that show nutritional status influences the risk of sarcopenia. Inadequate nutrition such as lack of protein, vitamin D and antioxidants is one of the factors needed in nutritional management. If it is not sufficient, it can reduce muscle function and is associated with the risk of sarcopenia. Previous research has shown that low protein intake, particularly vitamin D, is associated with decreased muscle function and muscle

mass. Education about a balanced diet and adequate nutritional intake can be very effective in improving the nutritional status of the elderly. Apart from that, support from family and the environment in providing various types of healthy and balanced food is very important. Evaluation of eating habits also needs to be carried out to avoid nutritional problems in the elderly. Routine nutritional status assessments and intensive monitoring in nursing homes are necessary to ensure residents' well-being. Regular assessments of nutritional status can also help identify eating patterns in the elderly.

According to research conducted by Marzetti et al (2017), lack of physical activity is known to be the main factor in the occurrence of sarcopenia and functional disability in old age. Physical activity is also effective in reducing sarcopenia, restoring strength, and preventing or delaying the development of disability. Meanwhile, according to Prayuni et al, (2022), the results of the analysis of the PASE questionnaire in assessing physical activity showed that there was no significant relationship between physical activity level variables. These findings contradict the results of research by researchers which show a relationship between physical activity and the risk of sarcopenia. Based on the research results and explanation above, researchers assume that inactive physical activity has an effect on the risk of sarcopenia compared to respondents who engage in active physical activity. Previous theories also explain that a decrease in physical activity can result in a decrease in muscle mass due to muscle atrophy. This is characterized by a reduction in muscle fiber size, especially in type I (endurance) and type II (strength) muscle fibers. Physical activity and physical exercise are needed to prevent the risk of sarcopenia.

The type of exercise and physical activity required includes aerobic exercise and strength training. Aerobic exercise involves working muscles continuously over a long period of time. A decrease in physical activity can accelerate muscle mass loss, especially in the elderly who also experience muscle loss with aging.

Conclusions

Most respondents aged 70-79 years (53.6%), female (72.5%), not at risk of sarcopenia (55.1%), had a risk of malnutrition 28 respondents (40.6%) and physical activity respondents with a mean physical activity value of 131.96. There is a significant relationship between nutritional status and physical activity and the risk of sarcopenia p -value $< \alpha$. There is a relationship between nutritional status and physical activity on the risk of sarcopenia in the elderly at STW Ria Pembangunan Cibubur. It hope to input the sarcopenia material into learning cases and teaching and learning processes.

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