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Socio-Demographic, Nutritional Status, Risk Of Falls Toward Sarcopenia Among Community-Dwelling Elderly

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ABSTRACT
Sarcopenia is a condition of muscle degeneration, occurs due to multifactorial aging process and have impact toward increase hospitalization and mortality rates. The purpose of study was to analyze correlation between Socio-demographic, Nutrition, Risk of fall toward sarcopenia among community Dwelling Elderly in the Pekanbaru. Cross sectional study was conducted among 275 elderly selected by cluster sampling. Data were collected using questionnaires and analyzed using Bivariate (Chi-square test) analyses. The age mean of Respondents was 63,3±3,7, female was 63,6%, married was 90,2 %, Senior High School was 40,7 %, Unemployed was 69,1 %, Malnutrition was 12 %, Risk of fall was low 27,6%. There was a positive correlation between gender (p value 0,023), marital status (p value 0,019), Education level (p value 0,033), nutrition status (p value 0,014),mRisk of fall (p value 0,008) toward Sarcopenia. Suggestions for research, it is necessary to have further research related factors of Sarcopenia. For nurses, it is better provide health education regarding factors that may be changed in elderly. Therefore nurse should collaboration to stakeholder such as general practitioners, nutritionist, physiotherapist, family, making policy.

Keywords: Community-Dwelling Elderly, Nutritional Status, Risk of Falls, Sarcopenia

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BACKGROUND

Globally, the share of the population aged 65 years or over increased from 6 per cent in 1990 to 9 percent in 2019. That proportion is projected to rise further to 16 per cent by 2050, so that one in six people in the world will be aged 65 years or over (Nations, 2019). Currently, Indonesia is entering a period of population aging. Indonesia undergoing an increase older adults from 7,56% in the 2010 up to 9,7 % in the 2019 and estimate in the 2035 is 15,77 % .This can impact for elderly namely positive or negative impact (Sumandar, 2019). The growth and development among elderly occurs continue. This related changes in the body, namely aging process (Sumandar, Yesi Septina Wati, 2020).The WHO defines active aging as the process of optimizing opportunities for health, participation, and security in order to enhance quality of life as people age including those who are frail, disabled, and in need of care (Halaweh, Dahlin-Ivanoff, Svantesson, & Willén, 2018). Elderly were at high risk for the development of chronic ilnness and related disabilities (Sumandar, 2018). Aging is a universal, irreversible and individual process that causes morphophysiological changes in the musculoskeletal systems, central nervous system and sensory systems (visual, vestibular and proprioception), causing greater risk of falls (Concha-cisternas, 2019)

Sarcopenia is the ageing, sarcopenia can be considered as primary, geriatric disease characterized by progressive loss of skeletal muscle mass, loss of muscle function, constitutes rising, often undiagnosed health problem. It is prevalence in the elderly population is largely considered variable, as it ranges from 5% to 50% depending on gender, age, pathological conditions as well as diagnostic criteria (Zunic & Peter, 2018), (Papadopoulou, 2020). The risk factors and causes of sarcopenia must be identified to develop prevention and treatment strategies for this disease, particularly concerning lifestyle habits, which are more controllable in comparison to age- related systemic changes and genetic factors(Hai, Wang, et al., 2017).

Sarcopenia associated by neurological losses predisposes the reduction in skeleton muscular strength and body balance control, contributing to the occurrence of falls (Yeung et al., 2019). Malnutrition plays a key role in the pathogenesis of frailty and sarcopenia (Cruz-jentoft, Kiesswetter, Drey, & Sieber, 2017).Malnutrition is common in older adults and is associated with functional impairment, reduced quality of life, and increased morbidity and mortality (Donini et al., 2020). Some studies have been explored that Malnutrition indices and muscle mass and strength in the elderly are poorly investigated. Moreover, malnutrition seems to be 1 of the more important factors in the cause of sarcopenia (Liguori et al., 2018). Sarcopenia is a potentially modifiable risk factor for falls and showed that eldelrly presented an average risk of falls were 63,7 % (Yeung et al., 2019). Study about sarcopenia in the Pekanbaru not found. The purpose of study was to analyze the association socio-demographic, nutritional status, risk of falls toward Sarcopneia among community-dwelling older adults in Tenayan Raya Distric Pekanbaru Indonesia

METHODS

The design of this study was observasional analytic with a cross sectional approach and uses cluster sampling technique. The population his study were community dwelling elderly who lived Tenayan Raya distric. The sample size was determined using a single popula- tion proportion formula: $n=^{Z2}1-\alpha/2\times[p\times(1-p)/d2]$, with n=the required sample size, $Z1-\alpha/2=1.96$ (with $\alpha=0.05\%$ and 95% confidence interval), p=Insidance of sarcopenia on elderly and d=precision (assumed as 0.05). As there has been no study on sarcopenia incommunity dwelling in Pekanbaru. We assumed p to be 50%. Furthermore, the sample size for our study was calculated to be at least 275 respondents.

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The independent variables are socio-demographic, Nutritional status, Risk of falls and dependents variable is insidance of sarcopenia. The instrument used in study on socio-demographic is gender, marital status, Education, Employed status, and insidance of sarcopenia. For instruments have been translated into Indonesia language. Study based on inclusion criteria namely being able to cooperations and communication, fit of mental health, had no vision and hearing impairment during data collection processes. All participants were given verbal and written information about the aim of the study and they signed an informed consent form. The respondents were ensured confidentiality and informed that participation was voluntary and that they could drop out of the study at any time. The study received ethical approval from ethical review board for medicine and health research medicine faculty Riau University (Number.B/13/UN.19.5.1.1.8/UEPKK/2020).

Quaestionnaire of nutritional status using mini nutritional assessment (MNA). According to Guigoz L (2006) on (8) Mini Nutritional Assessment (MNA) represents 1 of the more specific tool to assess malnutrition state in geriatric settings. Instrument of risk of falls consering no risk of falls, low, and High. Assessment of muscle mass using Bioelectrical impedance analysis. Respondents stand barefoot on the analysis board and hold the detector with both hands. Data for muscle mass is taken by calculating the muscle mass index through the calculation of the appendicular skeletal muscle mass (ASM) which is obtained by the total muscle mass of both lower and upper limbs in kilograms divided by the square of height in meters. Assessment of muscle strength using a hand dynamometer limbs in kilograms. Measurements are made three times on the dominant hand and then the highest score is taken in a standing position (Liu et al., 2013). Physical performance measurement is done by measuring walking speed with a 6-minute walk test.The participants calculated the distance traveled during this time to determine the walking speed in meters per second. All process of the test run is 6 minutes. Data were presented by describing proportions of categorical variables. The significance on socio-demographic, nutritional status, risk of falls toward sarcopenia were used by chi-square with p value less than 0,05.

RESULTS

Table 1. Characteristics of Respondents (n=275)

Karakteristik responden	Number (%)
Age (Mean±SD)	63,3± 3,7
Sex	
Male	100 (36,4)
Women	175 (63,6%)
Marital Status	
Married	248 (90,2)
Widower/Widow	27 (9,8)
Education	
No School	1 (0,4)
Elementary School	44 (16)
Junior high school	44 (16)
Senior High school	112 (40,7)
Diploma/Bachelor/Master	74 (26,9)
Employed status	
Unemployed	190 (69,1)

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Employed	85 (30,9)
Nutritional status	
Malnutrition	33 (12)
At risk of malnutrition	26 (9,5)
Normal	216 (78,5)
Risk of Falls	
High	5 (1,8)
Low	76 (27,6)
No of risk	192(70,5)
Sarcopenia	
Negative	150 (54,5)
Positive	125 (45,5)

Table 1 concerning the characteristic of respondents shows that more than respondents was 63,3 years old. The majority of respondents in this studi was women (n=175; 63,6%). The marital status of respondents showed that more than half of respondents was married (n=248; 90,2%). The study showed that majority education of respondents were senior high school (n=112;40,7%).The employed status showed that more that half of respondents were unemployed (n=190; 69,1%). The study showed that nutritional status of the respondents were normal (n=216; 78,5%), respondent who malnutrition was (n=33; 12%), respondents who at risk of malnutrition was (n=26; 9,5%).The majority of respondents in this study did not of risk falls (n=192; 70,5%). The study showed that more than half of responedents was negative sarcopenia (n=150; 54,5%), respondents who positive sarcopenia was (n=125; 45,5%).

Table 2 Correlation of socio-demographic, Nutritional status, At risk of Falls toward Sarcopenia (n=275)

Variabel	Sarcopenia				*P-value*
	Positive		Negative		
	n	%	N	%	
Gender					
Male	55	55,0	45	45,0	0,023
Women	70	40,0	105	60,0	
Marital Status					
Married	119	48,0	129	52,0	0,019
Widower/Widow	6	22,2	21	77,8	
Education					
No School	1	100,0	0	0,0	
Elementary School	28	63,6	16	36,4	
Junior high school	21	47,7	23	52,3	0,033
Senior High school	49	43,8	23	52,3	
Diploma/Bachelor/Master	26	35,1	48	64,9	
Employed Status					
Unemployed	96	50,5	94	49,5	
Employed	29	34,1	56	65,9	0,017

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Nutritional status					0,014
Malnutrition	18	54,5	15	45,5	
At risk of malnutrition	18	69,2	8	30,8	
Normal	89	41,2	127	58,8	
Risk of falls					0,008
No of risk	5	100	0	0	
Low	34	44,7	42	55,3	
High	86	44,3	108	55,7	

Table 2 shows that gender, marital status, edication, Employed status, Nutritional status, Risk of falls have a significant toward sarcopenia (*pvalue*=0,023; *pvalue*= 0,019; *pvalue* = 0,033; *pvalue*= 0,017; *pvalue*=0,014; *pvalue*= 0,008)

DISCUSSION

Socio-demographic toward sarcopenia among community dwelling elderly

Gender, marital status, education, Employed status show that have a significant toward sarcopenia. Based on studies have been done explored by education have a correlation with sarcopeni among community dwelling in china and Vietnam (Nguyen et al., 2020) (Hai, Wang, et al., 2017). Thus Sex, age, marital status were significantly associated with handgrip strength (Bibiloni et al., 2018). Elderly with unemployed is more likely to be health disorder, physical workload will being impact on disorder muscle (Utumo, 2019). A study time for do physical activity related to employed status and it is see among their unemployed just stay in home without (Sumandar, 2020).

According to researchers, socio-demographic cannot be changed, but it requires the involvement of internal and external factors. Internal factor comprise motivation of the elderly regarding the importance of caring and promoting a healthy culture so that the health status can be achieved optimally. In addition, the family must also support the elderly in a more sustainable manner and assist them in obtaining health services.

Nutritional status toward sarcopenia among community dwelling elderly

The result shows that have a significant Nutritional status toward sarcopenia with *p value* 0,0014. Nearly half of the elderly population is categorized as malnutrition (45,5 %). Malnutrition is common among older people over 60 years of age. The prevalence of malnutrition in older people living in the community ranges between 1.3% and 47.8% (World Health Organization (WHO), 2017).

Some studies previous studies have suggested that nutritional status in the elderly was related by sarcopenia (Papadopoulou, 2020), (Hai, Cao, et al., 2017), (Bando, 2020), (Vandewoude, Alish, Sauer, & Hegazi, 2012), (Das et al., 2020), (Kim et al., 2019), (Malafarina et al., 2019), (Hu et al., 2017). According to researchers this condition were caused by internal factors. Sarcopenia disorder are closely related to muscle strength, muscle mass, and physical performance. In order to fulfill these three conditions, it takes energy from the elderly. The strenght can be obtained by daily nutritional intake. This is also supported by previous studies suggesting that a more rational approach to delaying the development of sarcopenia. It is based on the right combination of nutrients, possibly related to the use of dietary supplements (Rondanelli et al., 2015). Although sarcopenia can be explained by some fixed factors, many factors are not modifiable. This fact has led to increasing interest in the influence of lifestyle on muscle mass and function in older people.

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These factors include various aspects of food consumption patterns, physical activity, alcohol intake, and tobacco use (Hai, Wang, et al., 2017).

Risk of falls toward sarcopenia among community dwelling elderly

The result shows that have a significant risk of falls toward sarcopenia with *p value* 0,008. A Increases the risk of falls in eldlellry caused and contribute to poorer health (Santos et al., 2019). A study (Cevei, Onofrei, Cioara, & Stoicanescu, 2020) *showed* that the factors significantly associated with sarcopenia. According to (Yeung et al., 2019) with cross-sectional studies in which sarcopenic individuals had higher risk of retrospective falls and fractures compared with non-sarcopenic individuals. Thus, the study in line with indicated that male participants with sarcopenia had a higher risk of falls than mixed gender participants with sarcopenia. This study in line with (Zhang et al., 2020) showed that the male participants with sarcopenia had a higher risk of falls than mixed gender participants with sarcopenia

According to researchers, risk of falls in the community dwelling elderly caused by reduction mucle mass. The existence of this condition affects the incidence of sarcopenia. The indicators of the appearance of sarcopenia are muscle strength and mass and lack of physical performance. Furthermore, a study (Concha-cisternas, 2019) showed that a changes include the reduction in number and size of muscle fiber, loss of muscle strenght. The combination of these alterations translates into a greater vulnerability of the elderly in the face of disturbances in both static and dynamic activities

CONCLUSION

In this study the importance of sarcopneia as topic for primary health center and the importance of the to determine sarcopneia are high point. The results showed that insidance of sarcopenia in the studied population is within socio-demographic, nutritional status, risk of fall. Thus, it is important to obtain a colaboration approach toward nurse, nutritionist, physiotherapist, general practitioners, family, making policy

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