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Analysis of Frailty Syndrome in Elderly Farmers

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ABSTRACT

Background: Lampung with a high population of farmers has an aging population that has impacted several increasing health problems, one of which is Frailty Syndrome, also called geriatric syndrome. This study aimed to determine the sociodemographic aspects, family functions, marital status, educational status, psychology, cognitive, and sleep quality among elderly people with Frailty Syndrome. **Methods:** The research used an analytic observation method and a cross-sectional approach with a purposive cluster sampling technique. This research was conducted in 7 villages in Muara Sungkai sub-district, North Lampung district, on 77 elderly farmers. The inclusion criteria were: agreed to the informed consent, aged >60 years, and did not have a disability. Identification of Frailty Syndrome was based on the FRAIL-J instrument. Family function was assessed by Smilkstein's Family System APGAR items, cognitive function used the Mini Mental State Examination instrument, psychological status was measured by the Geriatric Depression Scale instrument and sleep quality measurements used the Pittsburgh Sleep Quality Index. **Results:** The results showed 78% elderly farmers with Frailty Syndrome and 22% experienced pre-frailty. Variables related to Frailty Syndrome were age ($p=0.014$; 95% CI: 0.013 – 0.871), Family Function ($p= <0.01$; 95% CI: 2.998 – 28.038), Educational Status ($p=0.039$; 95% CI: 1.164-29.353) and sleep quality ($p=0.033$; 95% CI: 1.133-11.154) had a significant relationship with Frailty Syndrome. **Conclusion:** Age, family function, educational status and sleep quality are significantly associated with Frailty Syndrome.

Keywords: elderly, farmer, family function, Frailty Syndrome

INTRODUCTION

Elderly, according to Law Number 13 of 1998 is person who has reached the age of 60 (sixty) years and over. Globally, the elderly population in 2021 was over one billion people. Indonesia is a developing country that has an increasing proportion of the elderly population, with proportions rapidly increasing from 4.5% in 1971 to 10.7% in 2020, and 10.82% in 2021^{2,3,4}.

As age increases, so do the problems experienced in the elderly. As is well-known, the elderly experience an aging process that has an impact on various aspects, including health, especially geriatric syndrome. Frailty syndrome (FS) is a set of symptoms that arise related to decreased adaptive function of several organs and homeostatic decline and increased vulnerability when exposed to stressors that have an impact on causing weakness and psychological or social decline that is detrimental and related to aging, which can also occur in the elderly if they do excessive physical activity^{5,6}. FS in the elderly increases the risk of falls, frequency of hospitalization, dependence on family, and even mortality. It also could cause postoperative complications, so it is used as a useful risk assessment tool for preoperative evaluation in elderly patients undergoing surgery. Elderly with FS have a decreased immune system,

making them susceptible to infections and complications. As well as having an increased susceptibility to cancer, and increased mortality, FS is also associated with cognitive decline and dementia⁷.

Muara Sungkai is a sub-district in North Lampung Regency with an area of 11,869 km² which includes rural areas and a population of 140,423. There are 11 villages consisting of Bandar Agung, Banjar Negeri, Banjar Ratu, Karang Mulyo, Karang Rejo II, Karang Sakti, Karang Sari, Negeri Ratu, Negeri Ujung Karang, Pakuon Agung, and Sumber Agung. The main source of the community's livelihood is farming, especially hard crop plantations, such as cassava, corn, sugar cane and rubber. Total population of elderly farmers in Lampung Province is 298,880 consisting of 1,015 women and 283,783 men. Meanwhile, most people in North Lampung regency work as a farmer with as many as 34,000 workers and the number of elderly farmers in Muara Sungkai district is 16,376 farmers⁸.

METHODS

An analytical observational design with a cross-sectional approach was adopted in this research. The cluster sampling conducted in 7 villages in Muara Sungkai district, North

Lampung in January-February 2021 and with 77 elderly were recruited as respondents. The FRAIL-J questionnaire was used to assess respondents' FS, while the Mini Mental State Examination (MMSE) was used to assess cognitive function, The Smilkstein's Family System APGAR items questionnaire was used to assess family function and also The Pittsburgh Sleep Quality Index (PSQI) was used to

measure sleep quality. The collected data were analyzed univariately and bivariately to obtain the distribution of each variable and factors associated with FS in elderly farmers. This research was approved by The Research Ethics Committee of The Faculty of Medicine, University of Lampung with number 78/UN26.18/PP.05.2.00/2021.

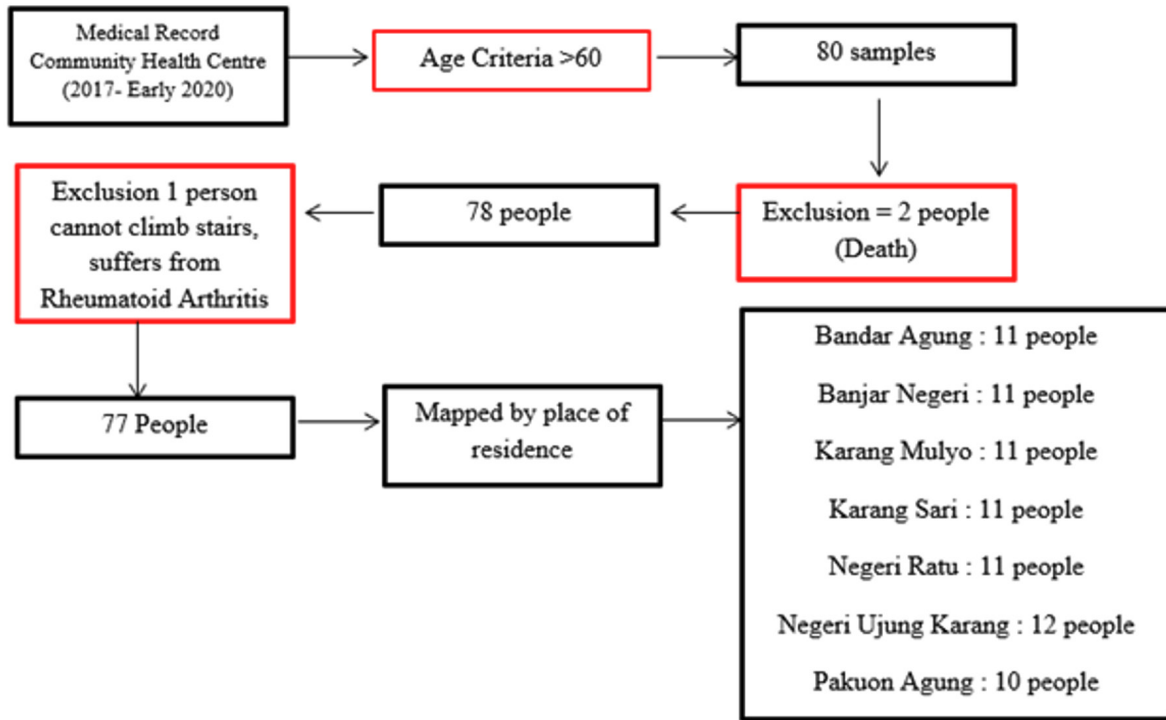


Figure 1. Sampling technique.

RESULTS

The results of the study in measuring Frailty Syndrome can be seen from Figure 2 and the frequency distribution of respondent characteristics and variables in the study can be seen in Table 1.

Based on the cluster sampling data in Table 1, the most

common age group is “young elderly” with 70.1%, which is predominately women with 76%. Educational status of elderly farmers is more than half at primary education with 59.7%, while marital status is not much different between those who are married and those who live alone either due to divorce or death with a percentage of married at 53.2% and live alone at 46.8%.

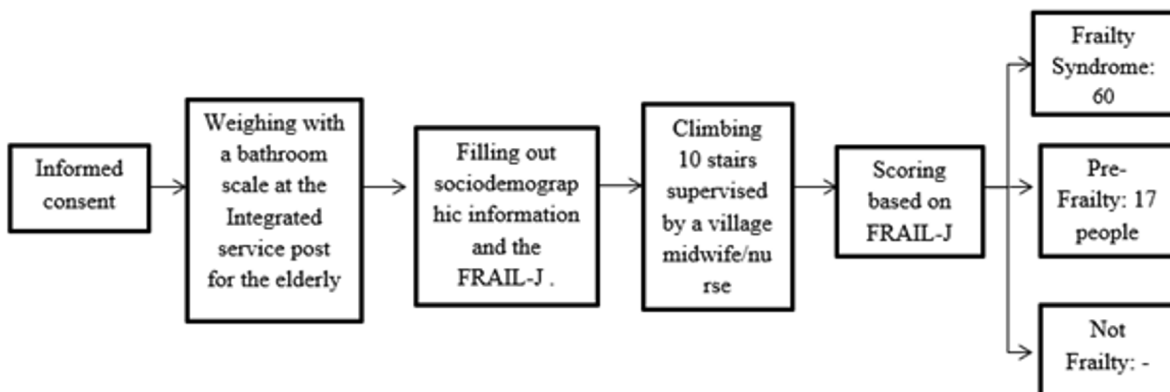


Figure 2. Measurement process.

Table 1. Frequency of Subjects' Characteristics

Characteristics	N	%
Elderly age group		
60-69 years old (young elderly)	54	70.1
70-79 years old (mid elderly)	19	24.7
> 80 years old (old elderly)	4	5.2
Sex		
Male	18	23.4
Female	59	76.6
Level of Education		
No education/Did not finish elementary school	28	36.4
Basic education (Elementary, Ibtidaiyah School, Junior High School, Tsanawiyah School)	46	59.7
Middle Education (Senior High School, Aliyah School, Vocational High School, Aliyah Vocational School)	2	2.6
High Education (D1/D2/D3/D4, S1/Bachelor, S2/Master/Profession. S3/Doctor)	1	1.3
Marital Status		
Not married yet	0	0
Married	41	53.2
Divorce/Widow/Widower	36	46.8
Total		100

Table 2. Frequency Distribution of Frailty Syndrome, Family Function, Sleep Quality, Cognitive Function, Sleep Quality and Bivariate Analysis

Variable	Frailty Syndrome		P value	Odds Ratio	95% Confidence Interval
	Frailty Syndrome A/B (%)	Pre-Frailty A/B (%)			
Age					
>70 years	22/17.9 (28.6)	1/5.9 (1.3)	0.014**	0.108	0.013-0.871
60-69 years	38/42.1 (49.4)	16 /11.9 (20.8)			
Educational Status					
Elementary School	57/54.5 (74.0)	13/15.5(16.9)	0.039**	2.143	1.164-29.353
Junior, Senior High School	3/5.5 (3.9)	4/1.5 (5.2)			
Family function					
Moderately functional/ Dysfunctional	47/40.3 (61.0)	3/9.7 (3.9)	<0.01**	12.5	2.998 – 38.038
Highly Functional	15/21.7 (19.5)	12/5.3 (15.6)			
Sleep Quality					
Low	48/44.4 (62.3)	9/12.6 (11.7)	0.033 *	2.286	1.133-11.154
High	12/15.6 (15.6)	8/4.4 (10.4)			
Marital Status					
Widow/widower	31/28.1 (40.3)	5/7.9 (6.5)	0.168 *	0.341	0.805 – 8.181
Married	29/31.9 (37.7)	12/9.1 (15.6)			
Gender					
Male	14/14.0 (18.2)	4/4.0 (5.2)	1 *	0.802	0.278-3.523
Female	46/46.0 (59.7)	13/13.0 (16.9)			
Psychology					
Probable depression/depression	59/58.4 (76.6)	16/16.6 (20.8)	0.395**	0.284	0.218-62.257
No depression	1/1.6 (1.3)	1/0.4 (1.3)			
Cognitive Function					
Low-moderate	58/56.9 (75.3)	15/16.1(19.5)	0.210**	3.867	0.503-29.753
High	2/3.1 (2.6)	2/0.9 (2.6)			

(*) : chi-square test.

(**): Fisher exact test.

Table 2 shows showed that 78% respondents experience FS, while the remaining 22% are pre-frailty and there are no elderly who are not considered with frailty. More than half of the population had moderate family function with 57.1% and 7.8% had family dysfunction. Most farmers experience poor sleep quality at 74%, and most have moderate cognitive function at 76.6%, and more than half of the population may have psychological disorder, namely 57.1%. Table 2 shows that the variables significantly associated with FS are age ($p=0.14$; 95% CI: 0.013—0.871), educational status ($p=0.039$; 95% CI: 1.164-29.353), family function ($p= <0.01$; 95% CI: 2.998 – 28.038) and sleep quality ($p=0.033$; 95% CI: 1.133-11.154), while other variables had no significant correlation.

DISCUSSION

The majority of farmers in this study were in the young elderly group. These results are in accordance with the statistical data on the elderly population both in Indonesia and in North Lampung regency, which has the highest proportion of the young elderly⁹. The greater distribution of young elderly is caused by several factors, one of which is life expectancy according to BPS data in 2020 that indicated the life expectancy of men is 69 years while for women, it is 72 years. This study found more elderly farmers were female and similar with the life expectancy of men, which is 69 years, while the women are higher at 73 years of life expectancy. A significant increase in life expectancy occurs mostly in women, so this could answer why the population in rural areas is dominated by women¹⁰.

One third of elderly farmers are divorced/widowed. Marital status is a factor that is considered, while the psychological factors and family support are positive influences on the health of the elderly. The transition from living with a partner to without a partner implies health risks such as depression and widow/widower tend to have a lower life expectancy than those who without a partner. Elderly people who lose a partner due to the death or divorce usually experience great sadness, stress and worry and loss of social and material support¹¹.

Half of the population only completed primary education. This finding is in line with Rahmita's 2015 research¹², which found that education level is one of the predisposing factors that influence the utilization of health services by individuals. Educational status affects the utilization of health services because there may be lower awareness and knowledge about health. Due to the fact that most of the elderly have a birth year below 1960, then the youngest were entering junior high school age in 1970. This is in accordance with the condition of the State of Indonesia based on Government Regulation of The Republic Indonesia no. 47, 2008 considering that 9 years compulsory education program was launched by the government since 1995 and the first ones were only planned to be completed in 2008.

Most of the farmers in this study experienced FS. This is not in line with a previous study conducted by Wistara in Pendawa village that found FS only occurs in one third of

the population¹³. The difference was that in the Pendawa study, FS was measuring weakness with FFPQ grasping handgrip, while this study used the FRAIL-J climbing 10 steps as a measuring tool. The use of handgrip only shows grip strength¹⁴, but climbing stairs includes cardio-type exercise that can measure ventilation and increased maximum oxygen uptake¹⁵. This present study also conducted cluster sampling, which means the findings are more representative of the general population.

More than half of the elderly farmers have moderate family function and only one third experience good family function, almost the same as elderly families in Aceh Besar District and in line with research that indicated the elderly who live with their children or live close to one another in an area can have a better quality of life and family function, because they still get support from their families so that they can help carry out their daily activities. The results of this study are in line with other studies which show that there is a relationship between family function and the quality of life of the elderly. Other studies have also shown that there is a significant relationship between family function and the quality of life of the elderly¹⁶. This finding also reinforced the importance of assessing the patients' family function, especially in the elderly¹⁷ because it affects the onset of FS.

Most of the elderly farmers have worse sleep quality, because they tend to experience changes in the quantity and quality of their sleep. This is as impact of the aging process¹⁸. When the elderly usually take longer to fall asleep, it can disrupt homeostasis¹⁹. More than half of the elderly farmers are likely to have depressive disorder. Depression in old age is associated with increasing age, women, living alone, widowhood, low educated level, functional impairment, physical illness, comorbidity, and low level cognitive dysfunction²⁰. More than half of the elderly in this study experience moderate cognitive function. Broadly speaking, the data characteristics of this study show a decrease in cognitive function, which was in line with previous research that indicated a similar result. Also, most of the farmers had only completed elementary school. This condition could affect the result of MMSE scoring such as the respondents may not understand the meaning of some questions. Research has shown that literacy and cognitive function are related to lifestyle factors such as intellectual stimulation and social function²¹.

There is a significant relationship between age and FS in elderly farmers. According to previous study, it was found that the risk of FS was 2.7 times higher among those aged over 70 years²². There is a significant relationship between educational status and FS. Lack of adequate education can cause several negative impacts. For example it becomes difficult to communicate, to get a decent job so that daily needs are not fulfilled, there may be increased dependence on others so that they cannot live independently which can cause a decrease in health status and increase the risk of developing frailty²³.

Family function and FS have a significant relationship in this study. More than half of the elderly farmers with moderately/dysfunctional family function experienced FS.

The Da Silva study found that FS in elderly in outpatient services was associated with high levels of family dysfunction²⁴. There was a higher likelihood of frail older adults having dysfunctional families compared to non-frail ones. When assessing the level of family functioning, the health, wellbeing and aging study (SABE) found there were more frail older people with higher or medium dysfunctional families²⁴. The care in dysfunctional family will be disrupted and will affect the fulfilment of the needs of the elderly themselves, because social isolation is an important risk for morbidity and mortality²⁵.

Sleep disorder could lead to increased oxidative stress and metabolic changes that increase the risk of the occurrence of FS²⁴. Elderly people with poor sleep quality experience low quality of life, cognitive decline, depression, inhibition of daily activities, increased risk of falls, cardiovascular disease, and other disorders. According to the World Health Organization (WHO), about 50% of elderly have complaints of sleep problems. Poor sleep quality will affect the physiological effects on the brain and cause serious biological stress on cells, organs, and the body's main regulatory systems²⁶.

Several variables that are not associated with FS include gender, marital status, psychological aspect and cognitive function. Gender is not related with FS because women are the majority in this study population. They also still working actively, so that they have low risk of muscle atrophy²⁷. Marital status is not related with FS in this study because the respondents of this study are farmers who have independence and higher levels of physical activity than other elderly, which will have more influence on slowing FS²⁸. There is no relationship between FS and the psychological aspects and cognitive function in this study. It may be caused by the sociocultural aspects of the farmers in this study which could support them to face their live problems. Farming community includes rural society that has a strong neighborhood, peaceful setting, and a culture of helping each other, all of which would support the members of community especially the elderly people.

CONCLUSIONS

Frailty Syndrome in elderly farmers in Muara Sungkai District is significantly associated with age, educational status, family function and sleep quality. Farmers who tend to be at risk of FS are farmers aged over 70 years, elderly farmers with moderate or impaired family function, elderly farmers who only completed low level education, and elderly farmers with poor sleep quality are more likely to be at risk of Frailty syndrome.

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