Logistic Regression on Factors Affecting Depression among the Elderly

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ABSTRACT

Background: Mental health problems, especially depression, have a major impact on the elderly. Depression is a major contributor to the burden of disease globally which can cause suicide. This study aimed to determine the factors that influence depression in the elderly.
Subjects and Method: This was an analytic observational study with a cross sectional design. It was conducted from October to December 2018. A total of 200 elderly was selected by simple random sampling. The dependent variable was depression. The independent variables were income, history of chronic illness, family function, social interaction, social support, social isolation, and loneliness. Data on depression was measured by Geriatric Depression Scale 15 (GDS-15). The other data were collected by questionnaire and analyzed by a multiple logistic regression.
Results: The risk of depression in elderly increased with history of chronic illness (OR= 8.03; 95% CI= 1.48 to 43.42; p= 0.016), social isolation (OR= 6.05; 95% CI= 1.41 to 25.98; p= 0.015), and loneliness (OR= 7.14; 95% CI= 1.62 to 31.41; p= 0.009). It decreased with high income (OR= 0.14; 95% CI= 0.03 to 0.60; p= 0.008), strong family function (OR= 0.13; 95% CI= 0.02 to 0.67; p= 0.014), strong social interaction (OR= 0.11; 95% CI= 0.02 to 0.48; p= 0.003), and strong social support (OR= 0.16; 95% CI= 0.04 to 0.65; p= 0.011).
Conclusion: The risk of depression in elderly increases with history of chronic illness, social isolation, and loneliness. It decreases with high income, strong family function, strong social interaction, and strong social support.

Keywords: depression, elderly, income, chronic illness, family function, social factors, loneliness

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BACKGROUND

WHO estimates that by 2020, the depression will increase from fourth to second under ischemic heart disease as a cause of disability and health burden, and is estimated to be in first place in 2030 (World Federation for Mental Health, 2012). Riskesdas data in 2013 show that the prevalence of mental emotional disorders (symptoms of depression and anxiety) amounted to 6% for ages 15 years and over (including elderly). This means that more than 14 million people suffer from mental emotional disorders in Indonesia (RI Ministry of Health, 2013a).

In accordance with the purpose of the third SDGs, which is to ensure a healthy life and promote prosperity for all people of all ages, the elderly group (elderly) is also entitled to a healthy life and well-being. This is very important because the population of the elderly in the world begins to increase or enter the old structure. In 2017 the population of the population aged 60 years and over is 962 million. The number of elderly people is expected to continue to increase until the year 2050 is projected to reach almost 2.1 billion. Two-thirds of the elderly population resides in developing regions and the number of growth is faster

than developed countries (United Nations, 2017).

The aging process is a physiological process that will occur in everyone and the mechanism is different for each individual, where there is a decrease in body organ function in general. This process raises various problems in the elderly, such as biological and social problems in individuals (Susilowati, 2016). Elderly people who have chronic diseases such as strokes have the chance to experience depression 3.3 times higher than the elderly who do not have chronic diseases (Peltzer, 2013).

Mental health problems, especially depression can cause a large impact on the elderly, including reducing the ability of the elderly to carry out daily activities, reducing the independence and quality of life of the elderly (World Federation for Mental Health, 2013). Depression is a major contributor to the burden of the disease globally, in the most severe conditions of depression can cause suicide (WHO, 2018).

Suicide is still one of the causes of the high mortality rate in Gunungkidul, Yogyakarta, Indonesia. On average in the last 17 years, there have been 28-29 suicides each year. In 2017, there were 34 suicides, the number of these cases increased significantly since 2014, there were 19 suicides and then increased in 2015 and 2016 to 33 cases. The suicide in Gunungkidul was dominated by the elderly as much as 44%. The high incidence of suicide from year to year is actually one indicator of mental health and community welfare problems (IMAJI, 2017).

Depression in the elderly often results from a variety of social problems such as physical health status, economic status, loneliness or living alone (Kim and Chen, 2011).This is related to family type, marital status, social activity (Brown et al., 2017), and family support (Tanner et al., 2014). Based on various problems related to mental health, especially depression of the elderly, continuous assistance needs to be done and research related to factors that influence depression in the elderly.

SUBJECTS AND METHOD

1. Study Design

This study was an analytic observational study using cross sectional design. This study was conducted in Karangmojo Subdistrict, Gunungkidul Regency, Yogyakarta, Indonesia, from October to December 2018.

2. Population and Samples

The source population in this study was elderly aged ≥ 60 years who were in the Karangmojo Subdistrict area. The samples were chosen by using simple random sampling as many as 200 research subjects.

3. Study Variables

The dependent variable was depression of the elderly. The independent variables are income, history of chronic illness, family function, social interaction, social support, social isolation, and loneliness.

4. Operational Definition of Variables

Depression was defined as a feeling of distress felt by the elderly in the last 2 weeks.

Income was defined as the average income of the elderly each month either alone or obtained from children.

A history of chronic diseases was defined as verbal information expressed by respondents regarding a disease that has been suffered for a long time (> 1 month) and the disease interferes with the daily activities of the elderly.

Family function was defined as the process of relationships between families and their social environment as a place to exchange between family members to meet the physical needs and emotional needs of each individual.

Social support was defined as assistance provided by people around the elderly who have a kinship relationship or do not have a kinship relationship, whether in the form of emotional, instrumental, informative and friendship support that can provide comfort, self-esteem and become a mediator in solving problems for the elderly.

Social interaction was defined as an interrelated relationship between individuals, social groups, and society.

Social isolation was defined as a situation in which an individual experiences a decline or even is totally unable to interact with other people so that a person's involvement in family and friends is reduced.

Loneliness was defined as a feeling that is less pleasant due to the lack of a good relationship with other people and tends to withdraw from the surrounding environment.

5. Study Instruments

Family function was measured by Adaptation, Partnership, Growth, Affection, and Resolve (APGAR) questionnaire. Social support questionnaires use The Social Provisions Scale (SPS). The social isolation questionnaire used the 6-item Lubben Social Network Scale questionnaire (LSNS6-item). The lonely questionnaire uses the lonely scale of The De Jong Gierveld 6-item, as well as the depression questionnaire for elderly people using Geriatric Depression Scale 15 (GDS-15*)*.

6. Data Analysis

Univariate analysis was carried out to obtain the frequency distribution and the percentage of the characteristics of the research subjects. Bivariate analysis was performed to analyze the relationship between independent and dependent variables using the Chi-Square test and the calculation of Odds Ratio (OR) with 95% CI and significance level p <0.05. Multivariate analysis using multiple logistic regression analysis.

7. Research Ethics

The ethics of this study included informed consent, anonymity, confidentiality, and ethical approval. The ethical clearance was obtained from Research Ethics Committee, Faculty of Medicine, Universitas Sebelas Maret, Central Java, with number: 318/-UN27.6/ KEPK/2018.

RESULTS

1. Sample Characteristics

Table 1 showed sample characteristics. Table 1 showed that the elderly aged 60-74 years were 148 (74%) and ages 75-90 years were 52 (26%). Elderly men were 32 (16%) and the female ones were 168 (84%). Most of the elderly have the last education of elementary school amounting to 103 (51.5%), no formal education of 42 (21%), junior high school of 36 (18%), senior high school amounting to 10 (5%), and tertiary education of 9 (4.5%).

2. BivariateAnalysis

Table 2 showed the results of bivariate analysis. Table 2 showed that had history of chronic disease (OR= 11.23; 95% CI= 4.83 –26.11; p<0.001), social isolation (OR= 15.85; 95% CI= 7.09 - 35.43; p<0.001), and loneliness (OR= 11.45; 95% CI= 5.29 - 24.79; p<0.001) increased the risk of depression.

High income (OR= 0.06; 95% CI= 0.03 – 0.15; p<0.001), good family interaction (OR= 0.05; 95% CI= 0.02 – 0.12; p<0.001), and high social support (OR= 0.07; 95% CI= 0.03 – 0.16; p<0.001) reduced the risk of depression.

Table 1. Sample Characteristics

Variable	N	%
Age		
Elderly (60-74 years)	148	74
Old (75-90 years)	52	26
Gender		
Male	32	16
Female	168	84
Education		
No formal education	42	21
Primary school	103	51.5
Junior high school	36	18
Senior high school	10	5
College	9	4.5

Table 2. The results of bivariate analysis

Variables	Elderly Depression				Total		OR	CI (95%)	p
	Not Depressed		Depressed						
	n	%	n	%	N	%			
Income									
Low	29	46.8	33	53.2	62	100	0.06	0.03 – 0.15	<0.001
High	128	92.8	10	7.2	138	100			
History of Chronic Disease									
No	113	93.4	8	6.6	121	100	11.23	4.83 – 26.11	<0.001
Yes	44	55.7	35	44.3	79	100			
Family Function									
Poor	30	46.2	35	53.8	65	100	0.05	0.02 – 0.12	<0.001
Good	127	94.1	8	5.9	135	100			
Social Interaction									
Low	28	45.9	33	54.1	61	100	0.06	0.02 – 0.14	<0.001
High	129	92.8	10	7.2	139	100			
Social Support									
Low	30	47.6	33	52.4	63	100	0.07	0.03 – 0.16	<0.001
High	127	92.7	10	7.3	137	100			
Social Isolation									
Low	135	91.8	12	8.2	147	100	15.85	7.09 - 35.43	<0.001
High	22	41.5	31	58.5	43	100			
Loneliness									
Low	135	90.0	15	10.0	150	100	11.45	5.29 - 24.79	<0.001
High	22	44.0	28	56.0	50	100			

3. Multivariate Analysis

Table 3 showed the results of multivariate analysis. Table 3 showed that there was an effect of income on elderly depression which was statistically significant. Elderly who have high income have a lower risk of depression, which was 0.14 times compared to elderly with low income (OR= 0.14; 95% CI= 0.03 to 0.60; p= 0.008).

There was an effect of family function on elderly depression which was statistically significant. Elderly who have good family function have a lower risk of depression, which was 0.13 times compared

to elderly with poor family function (OR= 0.13; 95% CI= 0.02 to 0.67; p= 0.014).

There was an effect of social interaction on elderly depression which was statistically significant. Elderly who had high social interaction have a lower risk of depression, which was 0.11 times compared to elderly with poor social interaction (OR= 0.11; 95% CI= 0.02 to 0.48; p= 0.003).

There was an effect of social support on elderly depression which was statistically significant. Elderly who have high social support have a lower risk of depression, which was 0.16 times compared to elderly with low social support (OR= 0.16; 95% CI= 0.04 to 0.65; p= 0.011).

There was a significant effect of history of chronic disease on elderly depression. Elderly who have history of chronic disease were 8.03 times more likely to experience depression than elderly who did not have history of chronic disease (OR= 8.03; 95% CI= 1.48 to 43.42; p= 0.016).

There was an effect of social isolation on elderly depression which was statistically significant. Elderly who experienced social isolation were6.05times more likely to experience depression than elderly who did not experience social isolation (OR= 6.05; 95% CI= 1.41 to 25.98; p= 0.015).

There was an effect of loneliness on elderly depression which was statistically significant. Elderly who experienced loneliness more 7.14 times more likely to experienced depression than elderly who did not experience loneliness (OR= 7.14; 95% CI= 1.62 to 31.41; p= 0.009).

Table 3. The results of multiple logistic regression

Elderly Depression	OR	CI 95%		p
		Lower limit	Upper limit	
Income	0.14	0.03	0.60	0.008
History of chronic disease	8.03	1.48	43.42	0.016
Family function	0.13	0.02	0.67	0.014
Social interaction	0.11	0.02	0.48	0.003
Social support	0.16	0.04	0.65	0.011
Social isolation	6.05	1.41	25.98	0.015
Loneliness	7.14	1.62	31.41	0.009
N observation = 200				
Log likelihood = -28.46				
p<0.001				

DISCUSSION

1. The effect of income on depression among elderly

This study showed that there was a significant effect of income on depression among elderly. This study was in accordance with a study by Aryawangsa (2016) which stated that elderly who have low monthly income were more likely to experience depression compared to elderly who have high income.

The low socioeconomic status was a strong risk factor for the depression among elderly (Paul et al., 2018). In addition, the responsibility of the head of the household was high from the psychological and economic side, it turned out that there were still many elderly who were supposed to enjoy their old days without the heavy burden of the family (Minister of Health RI, 2013).

2. The effect of history of chronic disease on depression among elderly

This study showed that there was an effect of history of chronic disease on depression among elderly. Elderly who have history of chronic disease were more likely to

experience depression compared to elderly who did not have history of chronic disease. Chronic disease suffered by the elderly was a significant risk factor for the occurrence of depression in the elderly (Kulkarni et al., 2015). Elderly people who have a high risk of chronic illness experienced depression by 3.3 times higher than those who did not have chronic diseases (Peltzer, 2013).

3. The effect of family function on depression among elderly

This study showed that there was a significant effect of family function on depression among elderly. Elderly who have a good family function have a lower risk of depression than elderly with lack of family function. Poor family support would cause the elderly to feel lonely and the impact was depression (Tanner et al., 2014). Social support that was part of family functions could reduce the vulnerability to stressful incidence, such as chronic diseases in the elderly population (Chaves et al., 2014).

Family was the closest people and the main support system for the elderly in maintaining their health. The role of the family included maintaining and caring for the elderly, maintaining and improving the mental status of the elderly, anticipating changes in socio-economic status and providing motivation and facilitating the needs of spirituals for the elderly (Padila, 2013). According to Yuli (2014), family function was a place to exchange between family members to fulfill the physical and emotional needs of each individual. Good family function was associated with good mental health status as well (Cheng et al., 2017).

4. The effect of social interaction on depression among elderly

This study showed that there was an effect of social interaction on depression among elderly which was statistically significant. Elderly who have high social interaction were less likely to experience depression than those who have low social interaction.

Triple loss was often occurred in the elderly, namely loss of role, barriers to social contact, and reduced commitment caused by the decreased social interaction of the elderly both in quality and quantity. Elderly who were always active and take part in many social activities were successful elderly (Yuli, 2014). Feeling discomfort with family, friends, or neighbors can also lead to depression in elderly (Xu *et al.*, 2018).

5. The effect of social support on depression among elderly

This study showed that there was an effect of social support on depression among elderly which was statistically significant. Elderly who have high social support were less likely to experience depression than those who have low social support.

Another similar study stated that there was a significant relationship between social support and the level of depression. Family social support has a relationship that was opposite to the level of depression. This mean that the higher the social support received, the lower the level of depression in the elderly. Social support was related to the function of social relations throughout certain social roles (for example, romantic partners, family members, friends, relations, etc.) (Parasari et al., 2015).

There were six types of social provisions, namely emotional attachment (feelings of intimacy, peace, and security), social integration, recognition, dependable dependence, guidance and opportunities for nurturing. Everyone needed all six types of social provisions, and if they missed one of them, then people would experience social and/or emotional loneliness. This

loneliness could lead to depression (Chiu *et al.*, 2017).

6. The effect of social isolation on depression among elderly

This study showed that there was an effect of social isolation on depression among elderly which was statistically significant. Elderly who experienced social isolation were more likely to have depression than elderly who did not experience social isolation. Social isolation contributed significantly to sleep disorders and depression in the elderly (Choi et al., 2015).

In addition, social isolation was related to the objective characteristics of a situation and refered to the loss of relationships with other people or in other words if someone has a very small number of social ties, it mean that she/he was socially isolated. The impact of social isolation was that it caused loneliness and symptoms of depression (Ihenetu T, 2017).

7. The effect of loneliness on depression among elderly

This study showed that there was an effect of loneliness on depression among elderly which was statistically significant. Elderly who experienced loneliness were more likely to have depression than elderly who did not experience loneliness. Another similar study stated that there was a significant and positive relationship between loneliness and depression in elderly (Aylaz et al., 2012).

Loneliness occurred when someone was not cared for or alienated by the people around him/her, isolated from his/her environment, even no one else can be a friend to share stories (Suadirman, 2011). Loneliness was the condition of someone who felt distant, alienated or excluded from his/her social environment and has an impact on health (Rahmi, 2015). Loneliness was a subjective complaint for the elderly (Eloranta et al., 2015) and often threatened the lives of the elderly when living separately from their families, losing their spouses, losing their peers, and helplessness to live independently. Loneliness in the elderly was divided into emotional loneliness and social loneliness. Emotional loneliness was caused by a lack of emotional connection with the family, while social loneliness was occurred because the elderly did not have social networks (Eloranta et al., 2015).

Loneliness in the elderly can lead to stress that affected the work of the heart, which triggered cardiovascular disease and increased mortality in the elderly (Leigh-Hunt et al., 2017). Increased stress due to loneliness can worsen the condition of being anxious, sad, depressed, and with drawing from the environment (Crewdson, 2016).

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