

THE ASSOCIATION BETWEEN LEVEL OF DEPRESSION AND FALL RISK IN ELDERLY

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ABSTRACT

Introduction: The prevalence of accidental falls rises as age increases. Mental issues also contribute to the increase risk of falling. Depression is one of the mental health illness that usually occur in elderly. This can worsen the physical condition and increase morbidity and mortality rate in elderly.

Aim: To investigate the association between level of depression measured using GDS (Geriatric Depression Scale) and fall risk measured using MFS (Morse Fall Scale) in elderly.

Methods: This research was held in Griya Lanjut Usia St. Yosef, and Rumah Usiawan Panti Surya Surabaya. The geriatric depression scale was used during this research to measure the level of depression and Morse Fall Scale to measure falling risk. This research is an analytic survey with cross sectional study design. Statistical analysis was performed using Pearson chi-square test and lambda correlation test.

Results: There is a significant association between level of depression measured using GDS and fall risk in elderly measured using MFS with $p=0,000$ ($p<0,05$) and correlation score of 0,613 indicating a strong correlation.

Conclusions: There is an association between level of depression measured using GDS and fall risk measured using MFS in elderly. There needs to be better awareness so that elderly can do normal activities with less limitation, and also to reduce the cost for elderly treatment in health clinic for their disabilities.

Keywords: Depression level, risk of fall, elderly.

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INTRODUCTION

Accidental falls are one of the health problems in the elderly which must be considered carefully. Accidental Falls in the elderly can increase the risk of mortality, morbidity, disability, and weakness. As the age increases, the incidence of Accidental Falls in the elderly also increases.⁽¹⁾

The cause of Accidental Falls in the elderly is often multifactorial. One of the factors that can cause Accidental Falls in the elderly comes internally from themselves, such as the presence of diseases that causes the physical condition of the elderly to deteriorate ⁽²⁾.

Apart from physical health problems, psychological disorders such as depression may also be one of the factors that causes Accidental Falls in the elderly ⁽³⁾. According to the World Health Organization, depression is in the fourth ranked diseases in the world⁴. *Riskesdas* 2013's data showed that the prevalence of mental disorders with symptoms of depression and anxiety reaches around 14 million people or 6% of the population in Indonesia ⁽⁴⁾. Depression causes people to ignore the habit of living a healthy life, thus worsening patient's physical condition. Medications for mental disorders are

associated with balance disorders and increase the risk of accidental falls⁽⁵⁾.

According to a study conducted by Turcu, *et al.*, it was found that depression was associated with a postural abnormality in a standing position, which could affect the risk of accidental falls ⁽⁶⁾.

With the emergence of several problems relating to deteriorating physical conditions of elderly people who experience depressive symptoms which increases the risk of accidental falls and the annual increase in the number of depression, the researchers are interested in investigating whether there is an association between the level of depression and the risk of accidental falls in the elderly.

METHODS

This study used an observational analytic design with a cross sectional approach. The research was conducted at *Griya Lanjut Usia St. Yosef*, and the *Rumah Usiawan Panti Surya Surabaya*. The subjects in this study were elderly people at *Griya Lanjut Usia St. Yosef* and *Rumah Usiawan Panti Surya Surabaya* who met the inclusion criteria and did not meet the exclusion criteria. The number of subjects is determined by using total sampling. The total number of

subjects from *Griya Lanjut Usia St. Yosef and Rumah Usiawan Panti Surya Surabaya* were 176. Measurement of depression level was carried out using a Geriatric Depression Scale questionnaire that had been modified. Fall risk measurement was performed using the

Morse Fall Scale Questionnaire. Hypertension and Diabetes as a risk factor also measured in this research. Data collection using questionnaires was carried out directly to the elderly and the subjects were guided to answer the questionnaires correctly.

RESULT

Table 1. Characteristics of Respondents

No	Characteristics of Respondents	n (%)	
1	Gender	Male	70 (40)
		Female	106 (60)
2	Age group	(60-74 years old)	68 (38,6)
		(75-90 years old)	108 (61,4)
3	Hypertension	Yes	62 (35,2)
		No	114 (64,8)
4	Diabetes Mellitus	Yes	32 (18,2)
		No	144 (81,8)
5	Depression	Yes	89 (50,6)
		No	87 (49,4)
6	Fall risk	Yes	96 (54,5)
		No	80 (45,5)

Table 2. Distribution of Diseases History and Fall Risk

No	History of Diseases and Fall Risk		n (%)
1	Hypertension	Risk of fall	42 (67,7)
		No risk of fall	20 (32,3)
3	Diabetes Mellitus	Risk of fall	22 (68,75)
		No risk of fall	10 (31,25)

Table 3. Distribution of Age Groups and Fall Risk

No	Age Groups and Fall Risk		n (%)
1	60-74 years old	Risk of fall	36 (52,9)
		No risk of fall	32 (47,1)
2	75-90 years old	Risk of fall	60 (55,6)
		No risk of fall	48 (44,4)

Table 4. Association Analysis between Level of Depression and Fall Risk in Elderly

Variable	Fall risk		Total n (%)	p*
	Yes	No		
Depression	Yes	12 (13,5)	89 (100)	0,000
	No	68 (78,2)	87 (100)	

*Analyzed using Pearson Chi Square

DISCUSSION

In this study, variables were examined include age, history of disease, level of depression, and risk of accidental falls. The number of respondents with risk of accidental falls are highest in the age group of 75-90 years, with 60 elderly who are at risk of Accidental Falls. This is based on the theory which states that the incidence of Accidental Falls increases in proportion to the increase in age. Increasing age in the elderly will result in a decline in physical, psychological and social well-being⁽⁷⁾.

The study examined subject's history of diseases, specifically history of hypertension and diabetes mellitus. The history of disease is adjusted to the theory of the influence of these diseases on the risk of accidental falls⁽⁸⁾. Of 62 people who had a history of hypertension, there were 42 elderly people who were at risk of Accidental Falls (67.7%) and 20 elderly people who had no risk of accidental falls (32.3%). Based on the results of this study, it can be assumed that the elderly group with a history of hypertension tend to fall into the risk of accidental falls. These results are consistent with the research conducted by Anupama, *et al.*⁽⁹⁾ who stated that history of hypertension had an

effect on the risk of accidental falls in elderly people⁽⁹⁾.

Of the 32 people who had a history of diabetes mellitus, there were 22 elderly people who were at risk of Accidental Falls (68.75%) and 10 elderly people who did not have risk of Accidental Falls (31.25%). Based on the results of this study, it can be assumed that the elderly group who had a history of diabetes mellitus tend to be at risk of falling. This is in accordance with a study conducted by Mettelinge, *et al*⁽¹⁰⁾ which demonstrated that history of diabetes mellitus had an effect on the risk of falling in the elderly. The study revealed that when compared with healthy control subjects, diabetic patients scored worse on all physical and cognitive examinations (Odds Ratio $p = 0.010$)⁽¹⁰⁾.

Based on the results of the Pearson Chi Square analysis and the Lambda correlation statistical test, it was found that there was a significant association between the level of depression and the risk of Accidental Falls in the elderly. This is shown by the significant degree or p value of 0,000 and the correlation value of 0.613, which shows a strong correlation. This is consistent with the research conducted by Turcu *et al.* which stated that there is a relationship between depression and Accidental Falls (p

<0.01). In the study, it was explained that elderly people who were depressed had postural abnormalities in the standing position, which could affect the risk of Accidental Falls. This is in accordance with theory about physical symptoms in people who are suffering from depression⁽¹¹⁾. People who have depressive disorders will experience physical symptoms such as decreasing level of physical activity, reduced work efficiency, and tendency to feel tired and ill. Decreased level of physical activity is believed to result in a decreased physical abilities including postural abnormalities and a decrease in ability to maintain balance, thus, increasing the risk of Accidental Falls in the elderly people⁽¹¹⁾.

According to the results of a study conducted by Stuart *et al*⁽¹²⁾, there is a significant relationship between depression and Accidental Falls ($p = 0.04$). In the study, it was found that respondents with major depressive symptoms for 12 months are more than twice as likely to fall.

A person with depression has symptoms of psychomotor retardation. Changes in psychomotor performance in depressive disorders are influenced by dysfunction in dopamine-rich areas, the basal ganglia, including the dorsal striatum. One problem that can contribute to psychomotor retardation

and psychomotor deceleration in depression is inflammation. Inflammation has been shown to alter neural activity and dopamine metabolism in the basal ganglia region including the dorsal striatum. This is associated with reduced psychomotor speed in healthy elderly subjects and therefore it can increase the risk of Accidental Falls⁽¹³⁾.

CONCLUSION

The results of this study indicate that there is a comparative association and a significant correlation between the level of depression and the risk of Accidental Falls in the elderly people at *Griya Lanjut Usia St. Yosef and Rumah Usiawan Panti Surya Surabaya*. The role of depression in the incidence of Accidental Falls in the elderly needs to be considered and prevented in order to improve the condition of a healthy, active, and productive elderly. By doing so, the cost of health services and disability in the elderly can be reduced, thus, the welfare of the elderly can be achieved.

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