

Analysis of Intrinsic and Extrinsic Factors with the Risk of Falls in the Elderly at the Elderly Posyandu

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ABSTRACT

Intrinsic, extrinsic and situational factors can help detect fall risk problems so that they can reduce the incidence of falls in the elderly. This study aims to analyze the factors associated with the risk of falling in the elderly at the Elderly Posyandu. The type of research used in this research is quantitative research with cross-sectional method. Respondents involved totaled 52 people, and were randomly selected using a simple random sampling technique. Data were obtained by questionnaire and analyzed using the Spearman rho statistical test and logistic regression. Results: The results of the analysis showed that intrinsic factors (movement disorders p:0.017, neurological disorders p:0.019 and visual impairments p:0.25) with the risk of falling, extrinsic factors (environmental p:0.003) with the risk of falling, situational factors (activity p: 0.031). Intrinsic factors (movement disorder OR: 324,092 and visual impairment OR: 27,240) Discussion: Intrinsic factor movement disorder is the most dominant factor associated with the risk of falling in the elderly. Further research is needed using qualitative methods to examine aspects of intrinsic factors associated with the risk of falling in the elderly.

Keyword: Elderly, Risk of falling, Intrinsic factor, movement disorder

ABSTRAK

Faktor instrinsik, faktor ekstrinsik dan faktor situasional dapat membantu mendeteksi masalah risiko jatuh sehingga dapat menurunkan kejadian jatuh Lansia. Penelitian ini bertujuan untuk menganalisis faktor-faktor yang berhubungan dengan risiko jatuh Lansia di Posyandu Lansia. Penelitian ini merupakan penelitian analitik korelasional dengan pendekatan cross sectional. Sampel penelitian menggunakan simple random sampling yaitu 52 responden. Pengumpulan data dengan cara wawancara dan pengisian kuesioner. Analisis data menggunakan analisis univariat, bivariat menggunakan uji Spearman Rho dan multivariat menggunakan uji regresi logistik. Hasil analisis menunjukkan faktor instrinsik (gangguan gerak p:0,017, gangguan neurologi p:0,019 dan gangguan penglihatan p:0,25) dengan risiko jatuh, faktor ekstrinsik (lingkungan p:0,003) dengan risiko jatuh, faktor situasional (aktivitas p:0,031). Faktor instrinsik (gangguan gerak OR:324,092. Saran dari hasil penelitian ini adalah perlu dilakukan tindakan pencegahan risiko jatuh Lansia dan tetap mempertahankan fungsi kemandirian Lansia

Kata Kunci: Lansia, Risiko Jatuh, factor intrinsic, gangguan Gerak.

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Introduction:

Elderly (elderly) is part of the human development process. No in a manner suddenly become old, but develop from baby, children, mature, and eventually grow old. The sharp increase occurred in the elderly (elderly) population and at risk of falling which could result in injury physique (Nugraheni, 2017).

The elderly population according to World Health Organization, it is estimated that in 2025 the number of elderly people worldwide will reach 1.2 billion people which will increase to 2 billion people in 2050. The prevalence of injuries falls in Indonesian residents above age 55 year reach 49.4%, age on 65 year to the top 67.1% (Kemenkes, 2019). The survey results in the elderly group in Bangkalan Regency show that 74% of the elderly are at risk of falling, even 44% of them are at high risk of falling. Results interview with 10 elderly people at the Jaddung village elderly posyandu, 4 elderly said Have ever fallen due to joint pain, 2 elderly say Once fall due to interference vision, 2 elderly say ever fall Because environment Which No safe and 2 seniors said never fall. According to Riyadina's research (2019) that the risk factors for falling consist of intrinsic, extrinsic and situational risk factors. Intrinsic factors such as heart problems, limb disorders, neurological disorders, visual impairments and hearing impairments, while extrinsic factors such as uneven floors, poor vision due to insufficient light and situational factors such as activity and medical history.

About 30% of older adults aged 65 and over who live in homes (communities) reported falling. Half of that figure falls repeatedly. About 50% of the elderly fall and 10-25% require hospital treatment. Both intrinsic and extrinsic factors influence falls in the elderly. Gender, chronic disease, muscle weakness, and age are intrinsic factors that favor falls in the elderly. Alcohol and drug consumption, the design or shape of the home, and the environment are also extrinsic factors that favor falls in the elderly (Agustina, 2021).

Increased susceptibility to fall events can pose a serious physical threat. Risk Falling on the elderly is an event that has bad consequences,

such as physical limitations, difficulty carrying out daily activities, injuries such as bruises, abrasions, sprains, respiratory problems, fractures, and the risk of death. Risk factors for falling must be prevented so that falls do not occur repeatedly by identifying or assessing the risk of falling in the elderly, and taking preventive measures to minimize the risk for the elderly (Darmojo, 2017).

Due to lighting factors, environmental factors are often associated with falls. It does not cause the view to be blurry or blurry, then there are household appliances that are no longer suitable for use or are unstable in shape, stairs that do not have fences or barriers, slippery floors or objects on the floor (such as carpets that are tripped), and toilets/bathrooms that do not have handles and toilets that are too low in position for parents to use. Additional environmental factors include dwellings inhabited by parents, hazards present within the home, accessibility of home environments, and medications consumed by parents. Based on the description above, The author is interested in conducting research. An analysis of the risk factors for falling in the elderly posyandu environment.

Methods:

This research is a correlational analytic study with a cross sectional approach. The population in this study were the elderly in the working area of the Jaddung Village Elderly Posyandu. The research sample used simple random sampling of 52 respondents. The independent variables are intrinsic factors (cardiac disorders, movement disorders, neurological disorders, visual impairments and hearing impairments), extrinsic factors (walking aids and the environment) and situational factors (activity and medical history). The dependent variable is the risk of falling. Data collection by means of interviews and filling out questionnaires. This questionnaire has been tested for validity and reliability. Data analysis used univariate analysis, bivariate used Spearman Rho test and multivariate used logistic regression test. information of ethical clearance fit test in STIKes Ngudia Husada Madura No.2119/KEPK/STIKes-NHM/EC/IV/2024.

Results:

Table 1. 1 Characteristics Respondents

Characteristics	Frequency	%
Age		
Middle Ages (45-59 years)	12	23,1
Elderly (60-74 years)	31	59,6
Old (70-90 years)	7	17,3
Very old (over 90th)	0	0
Gender		
Man	20	38,46
Woman	32	61,54
Education		
No school	2	3,8
Not completed in primary school	4	7,7
Graduated from elementary school	7	13,5
Graduated from SMP/MTs	24	46,2
Graduated from high school/vocational school	14	36,9
College Graduate	1	1,9
Work		
Doesn't work	4	7,7
Farmer	16	30,8
Trader	22	42,3
Private	4	7,7
civil servant	6	11,5
Etc	0	0
Disease History		
Hypertension	11	21,2
Diabetes mellitus	15	28,8
Arthritis	22	42,3
Osteoporosis	4	7,7

Based on table 1.1, it shows that the frequency distribution based on age is mostly elderly (59.6%), the gender is mostly female (61.54%), almost half of them have graduated from junior high school/MTs (46.2%), Almost half of them work as traders (42.3%) and almost half have a history of arthritis (42.3%).

Univariate

Table 1.2 Distribution of the frequency of variables related to the risk of falling in the elderly at the Elderly Posyandu in Jaddung Tragah Village

Variable	Category	Frequency	%
INTRINSIC FACTOR			
Heart problems	Low Risk	1	1,9
	Moderate Risk	33	63,5
	High Risk	18	34,6
Movement Disorders	Low Risk	3	5,8
	Moderate Risk	26	50
	High Risk	23	44,2

Variable	Category	Frequency	%
Neurological Disorders	Low Risk	3	5,8
	Moderate Risk	28	53,8
	High Risk	21	40,4
Visual Impairment	Low Risk	0	0
	Moderate Risk	51	98,1
	High Risk	1	1,9
Hearing Impaired	Low Risk	5	9,6
	Moderate Risk	27	51,9
	High Risk	20	38,5
EXTRINSIC FACTORS			
Walking Aid	No Risk	41	78,8
	Risky	11	21,
Environment	No Risk	29	55,8
	Risky	23	44,2
SITUATIONAL FACTORS			
activity	Low Risk	0	0
	Moderate Risk	36	69,2
	High Risk	16	30,8
Disease History	Low Risk	0	0
	Moderate Risk	45	86,5
	High Risk	7	13,5
FALL HISTORY	Low Risk	8	15,4
	Moderate Risk	30	57,7
	High Risk	14	26,9

Based on table 1.2 shows that the independent variable consisting of intrinsic factor variables found that most of the heart problems were at moderate risk (63.5%), movement disorders were half at moderate risk (50%), neurological disorders were mostly at moderate risk (53.8%), visual impairment almost all were at moderate risk (98.1%), hearing loss was mostly at moderate risk (51.9%). The extrinsic factor variable found that almost all walking aids were not at risk (78.8%) and the environment was mostly not at risk (55.8%), while the situational factor variable found that most activities were at moderate risk (69.2%) and a history of almost all were at moderate risk (86.5%). Meanwhile, the dependent variable of fall risk was found to be mostly at moderate risk (57.7%).

Bivariate

Table 1.3 Results of the Spearman Rho Statistical Test Intrinsic Factor with the Risk of Falling in the Elderly at the Elderly Posyandu in Jaddung Tragah Village

Intrinsic Factor	P-value	r	Relationship Direction
Heart Disorders	0.352	0.132	in the same direction
Movement Disorders	0.017	0.329	in the same direction
Neurological Disorders	0.019	0.323	in the same direction
Visual Impairment	0.025	0.312	in the same direction
Hearing disorders	0.156	0.200	in the same direction

Based on table 1.3, there is no significant relationship between the intrinsic factor of heart problems and the risk of falling (*p value* 0.352). (0.329) unidirectional, there is a significant relationship between the intrinsic factor of neurological disorders and the risk of falling (*p value* 0.019) the strength of the correlation is sufficient (0.323) unidirectional, there is a significant relationship between the intrinsic factor of visual impairment and the risk of falling (*p value* 0.25) the strength of the correlation is sufficient (0.312)) in the same direction, there is no significant relationship between the intrinsic factor of hearing loss and the risk of falling (*p value* 0.156) the strength of the correlation is very weak (0.200)

Table 1.4 Results of the Spearman Rho Statistical Test Extrinsic Factors with the Risk of Falling in the Elderly at the Elderly Posyandu in Jaddung Village

Extrinsic Factors	P-value	r	Relationship Direction
Walking Aid	0.666	0.061	in the same direction
Environment	0.003	0.400	in the same direction

Based on table 1.4, there is no significant relationship between the extrinsic factors of walking aids and the risk of falling (*p value* 0.666).

Table 1.5 Results of the Spearman Rho Statistical Test Situational Factors with the Risk of Falling in the Elderly at the Elderly Posyandu in Jaddung Tragah Village

Situational Factors	P-value	r	Relationship Direction
activity	0.031	0.299	in the same direction
Disease History	0.544	0.086	in the same direction

Based on table 1.5, it was found that there was a significant relationship between activity situational factors and the risk of falling (*p value* 0.031) the correlation strength was sufficient (0.299) in the same direction and there was no significant relationship between situational factors history of illness and the risk of falling (*p value* 0.544) the correlation strength was very weak (0.086) in the same direction

Multivariate

Table 1.6 Odds Value of the Most Dominant Independent Variable Ratio with the Dependent Variable

Variable	P value	OR value
Motion_Distraction(1)	001	324,092
Disorders_Neurology(1)	058	.034
Vision_Distraction(1)	022	27,240
Hearing_Disorders(1)	.431	.352
Environment	.377	.320

Based on table 1.6 above, the highest OR value is located in the movement disorder variable (OR : 324.092), followed by the visual impairment variable (OR : 27.240). The most dominant variable is movement disorder variable.

Discussion :

The relationship between intrinsic factors of heart disease and the risk of falling in the elderly

The results of the research on the intrinsic factors of heart problems showed that most of the respondents (33) were at moderate risk (63.5%), there was a significant relationship between the intrinsic factors of heart problems and the risk of falling (*p*: 0.352) and the correlation strength was very weak (0.132). in the same direction. Matter this is not compatible with study Roshima (2016) Which states that there is significant relationship between heart disease and senior fall risk.

According to Darmojo's theory (2016), elderly heart disorders such as hypertension where systolic blood pressure equal or higher than 140 mmHg and a diastolic pressure of more than 90 mm Hg, Which happen Because decline elasticity artery on process old. If left untreated, hypertension can trigger happening stroke, damage vessels blood (artery osclerosis) attack/fail heart so that can cause incident fall Elderly. Age is a risk factor for heart failure.

According to the researcher, elderly respondents who are male and work as farmers say heart sometimes pounding and there have history disease hypertension but does not interfere with daily activities. Therefore, it is hoped that the elderly will often participate in elderly posyandu activities to maintain their health. One of them is by measuring blood pressure regularly can prevent recurrence of

hypertension if the elderly concerned have hypertension.

Relationship between intrinsic factor of movement disorders and risk of falling in the elderly

The results of the research on the intrinsic factors of movement disorders showed that half of the respondents (26) were at moderate risk (50%), there was a significant relationship between the intrinsic factors of movement disorders and the risk of falling ($p: 0.017$), the strength of the correlation was sufficient (0.329) in the same *direction*. Matter This in accordance with study study Sutomo (2019) Which states that there is a relationship between limb disorders to risk fall Elderly.

The incidence of movement disorders increases with age. This can be caused by the aging process itself or due to the use of drugs that trigger movement disorders (Miller, 2018). Disorders of the limbs trigger changes in the balance of the elderly. Balance disorders can be caused by aging, accidents, drowsiness, drugs and illnesses.

According to researchers majority the elderly said that foot feels pain (rheumatic pain) when walk. Therefore, nurse can give counseling about exercise motion joints so that elderly can do it For overcome limitations motion And rigidity joints.

The relationship between the intrinsic factor of neurological disorders and the risk of falling in the elderly

The results of the study on the intrinsic factors of neurological disorders showed that most of the respondents (28) were at moderate risk (53.8%), there was a significant relationship between the intrinsic factors of neurological disorders and the risk of falling ($p: 0.019$), the strength of the correlation was sufficient (0.323) in the same *direction*. Matter This in accordance with study study Sutomo (2011) Which state There is connection between disturbance nerve to risk fall Elderly.

Change that occurs in innervation causes a decrease in nerve cells, changes in concentration occur neurotransmitters And integration signal

peripheral (visual, somatosensory, And vestibular) matter This can cause balance on body become disturbed (Chahyani, 2018).

According to researchers some seniors said experience impaired memory, decreased concentration and disorganized thought processes. Therefore, it is hoped that the elderly will often participate in elderly posyandu activities to maintain their health. One of them is by measuring blood pressure regularly and participating in Posyandu activities for the elderly every month

Relationship between intrinsic factor of visual impairment and the risk of falling in the elderly

The results of the study on the intrinsic factor of visual impairment showed that almost all of the respondents (51) were at moderate risk (98.1%), there was a significant relationship between the intrinsic factor of visual impairment and the risk of falling ($p: 0.25$), the correlation strength was sufficient (0.312) in the same *direction*. Matter This in accordance with study research by Anggraini (2017) which states There is connection between disturbance vision to risk fall Elderly.

Decreased vision in the elderly can result in limited activities elderly And trigger elderly experience slip, stumble Which will resulted elderlyrisky fall (Rigenastiti et al., 2018).

According to researchers, some elderly who experience disturbance vision say blurry see object around. So that For elderly Which experience disturbance vision is expected use tool help vision (glasses), while health workers provide counseling to the elderly regarding the conditions experienced by the elderly.

The Relationship between Intrinsic Factors of Hearing Loss and the Risk of Falling in the Elderly

The results of the study on the intrinsic factor of visual impairment showed that most of the respondents (27) were at moderate risk (51.9%), there was no significant relationship between the intrinsic factor of hearing loss and the risk of falling ($p: 0.156$), the correlation strength was very weak (0.200). Matter This not in line with

study research by Rokshima (2016) which states There is a relationship between hearing loss to risk fall Elderly.

Elderly hearing loss occurs because elderly experience a change in hearing, namely a decrease in sensorineural function on ear part in so that resulted elderly experience lost hearing in a manner gradually On ear part outside, hair will become Long and thick, skin becomes thinner and drier, the occurrence increase in keratin so that the elderly will experience sound conduction disorders (Sunaryo et al., 2016).

According to some elderly researchers Which experience hearing impaired are at high risk in terms of hearing, that is, they are not can hear If speak in a low voice. So for elderly Which experience disturbance hearing is expected use tool hearing aids.

Extrinsic Factors

1) Relationship between extrinsic factors of walking aids and the risk of falling in the elderly

The results of the research on the extrinsic factors of walking aids showed that almost all of the respondents (41) were in the non-risk category (78.8%), there was no significant relationship between the extrinsic factors of walking aids and the risk of falling ($p: 0.666$), the strength of the correlation was very weak ($p: 0.666$) . 0.061) in the same direction. This research is contrary to the results of Idris & Kurnia's research (2017) which states that there is a relationship between the use of walking aids and risk fall Elderly in Integrated Healthcare Center elderly RW 04 Kediri..

In line with Yanti & Armayanti's research (2018), which states There is a relationship between the activeness of elderly gymnastics and body balance Elderly because elderly gymnastics is shown for strengthening, endurance and dislocated bones and joints, resulting in a musculoskeletal system decline can be corrected, elderly exercise is also useful for maintaining fitness heart and loss of balance elderly..

According to researchers, some of the elderly still use walking aids using canes and crutches. Therefore, health workers can carry out programs to train balance in the elderly regularly so that the

elderly can reduce the risk of falling .

2) Relationship between extrinsic environmental factors and the risk of falling in the elderly

The results of research on environmental extrinsic factors showed that most of the respondents (29) were in the non-risk category (55.8%), there was a significant relationship between environmental extrinsic factors and the risk of falling ($p: 0.003$), the correlation strength was sufficient (0.400) . This research is in line with research conducted by Sutomo (2013) on factors related to the risk of falling in the elderly at the Wisma Mulia Nursing Home, West Jakarta, that there is a relationship between the living environment and the risk of falling in the elderly.

kindly general environment has a very close influence on the risk of falling because of one factor Which influence elderly fall is environment Which No safe (Achmanagara, 2018).

According to researchers majority the elderly said that lighting room that are not enough and the arrangement of goods that are untidy in the House. So that, recommended For elderly And family can tidy up goods in the House, minimize use carpet Which can make it fall, place objects that are often needed affordable by hand, change light Which more bright so that elderly can lighting Which in accordance.

Situational Factors

1) The relationship between situational factors and activities with the risk of falling in the elderly

The results of research on activity situational factors showed that most of the respondents (36) were at moderate risk (69.2%), there was a significant relationship between activity situational factors and fall risk (p value 0.031), the correlation strength was sufficient (0.299) in the same direction. Matter This in accordance with Hutomo research (2015) that state There is connection between elderly activity at risk fall Elderly.

According to Suhartini (2004), in East Java most of the elderly who do not engage in sports activities or other fitness activities 73.1% experience a high risk of falling. This is due to a decrease in the function and strength of the body's

muscles due to the lack of movement or activity carried out by the elderly.

According to researchers majority the elderly said that rarely do sports activities, there is difficulty in changing positions suddenly want to move places. So that, recommended elderly to participate in elderly gymnastic activities and The family is expected to always accompany and help the elderly in their activities at home.

2) Relationship between situational factors and history of disease with the risk of falling in the elderly

The results of the research on situational factors history of disease showed that almost all respondents (45) were at moderate risk (86.5 %), there was no significant relationship between situational factors and risk of falling (p value 0.544), the strength of the correlation was very weak (0.086) in the same direction. Matter This in accordance with Prihatmono's research & Puspasari (2017) which stated that there was no significant relationship between history of the disease and the risk of falling in the elderly. History of disease in this study was not only for hypertension, but also for diabetes mellitus and arthritis.

Getting older somebody so the more prone to caught disease especially disease pressure blood tall or hypertension (Mila, Anida & Ernawati, 2016). Diabetes mellitus is a chronic condition in older people and happen almost 25% on age >60 year.

According to researchers majority the elderly said that have hypertension and diabetes mellitus, but not daily activities. Therefore, it is hoped that the elderly will often participate in elderly posyandu activities to maintain their health.

Dominant factors associated with the risk of falling in the elderly at the Elderly Posyandu

The results showed that the highest OR value was found in the movement disorder variable (OR : 324.092), followed by the visual impairment variable (OR : 27.240). The most dominant variable is movement disorder variable. This is in accordance with Gruccione's research (2015) which states that getting older or elderly is always associated with a decrease in the level of physical

activity resulting in movement disorders.

Previous research by Yaffe et al. (2011) who concluded that motion including mobility was identified as one of the factors suspected to be related to the risk of falling and contributing 78.9% to the risk of falling.

According to researchers the dominant factor is the intrinsic factor of movement disorders. Majority the elderly said that foot feels pain (rheumatic pain) when walk. Therefore, nurse can give counseling about exercise motion joints so that elderly can do it For overcome limitations motion And rigidity joints. Balance disorders and related fall risk. Due to the decline in the natural motion function of the elderly, this limb system is associated with the risk of falling. The musculoskeletal system, which affects the ability to move, is affected by this decrease in function. As a result, older people who experience decreased movement function have a higher risk of falling. In addition to external factors that can affect balance and contribute to the risk of falling, parental postural imbalance control can increase the risk of falls. In bathrooms, bedrooms, and kitchens, falls are more common.

Conclusions:

Based on the results of the study it can be concluded that there is a significant relationship between intrinsic factors (movement disorders, neurological disorders and visual disturbances), extrinsic factors (environment), situational factors (activities) and the risk of falling in the elderly at the Posyandu Elderly in Jaddung Village. The most dominant fall risk factor associated with the risk of falling in the elderly at the Elderly Posyandu in Jaddung Village is the intrinsic factor of movement disorders. Therefore, it is suggested to health workers to continue to increase the socialization of fall risk prevention for the elderly, while for the elderly to maintain an efficient independent function. According to the above research, the health of the self-centered elderly should be improved, and then it is necessary to create an environment. which is safe and comfortable to reduce the chances of falling in older people. In addition, supervision of parents' actions is needed. Then the community can inform parents about the dangers in the home

environment to prevent falls. In addition, this research can be used as a reference to create an elderly-friendly environment in Bangkalan Regency. then used as an example in the health sector to support the learning process and used as a way to reduce the risk of falling. Other researchers are expected to research these variables further and use them as a basis for further research.

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