Analysis of Risk Factors for Falls in the Elderly at the Posyandu for the Elderly in Kradenan Village

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ABSTRACT
Elderly is part of a person's growth and development process, where the person has characteristics such as wrinkles on the skin, loss of teeth and gray hair. Based on the Central Statistics Agency in Indonesia, it is estimated that the number of elderly people will reach 207,930,000 in 2014 and 481,987,000 million in 2035. Increasing age causes degenerative processes that can increase the risk of experiencing disease and decreased function in the elderly. One of the decline in function is the function of the decline in the musculoskeletal system. Lower extremity muscle weakness causes balance disorders, these conditions can pose a risk of falling. Falls in the elderly can be influenced by intrinsic factors, extrinsic factors and situational factors. The type of research used in this research is descriptive analytic with a prospective approach. The sample selection was done by consecutive sampling technique and according to the inclusion, exclusion. Fall risk factors were measured using a questionnaire in the Technical Book for the Implementation of Physical Medicine and Rehabilitation Function Tests from Perdosri. The number of samples is 44. respondents with a high risk level are more respondent (81.8%) and are caused by intrinsic factors.

Keywords : Fall risk factors, elderly, intrinsic factors, extrinsic factors, situational factors

INTRODUCTION

Elderly are those who are more than 60 years old. Growing old is a natural process which means that a person has gone through three stages of life, namely children, adults and the elderly[1]. Globally, it is estimated that the elderly population will increase. In Indonesia, the elderly population is estimated to increase higher than the world's elderly population in 2100[2]. Based on the Central Statistics Agency in Indonesia, the projected number of elderly people is estimated to reach 207,930,000 in 2014 and 481,987,000 million in 2035. An increase in the number of elderly people This puts Indonesia in the top 5 countries with the largest elderly population in the world[3].

Aging causes degenerative processes that increase the risk of disease and functional decline in older adults. One of these functional declines is in the musculoskeletal system. This condition can cause lower extremity muscle strength to decrease. Weakness in the muscles of the lower extremities causes disturbances in body balance, this condition can increase the risk of falling[4].

A fall is a condition that causes a person to suddenly lie down or sit down with or without loss of consciousness or injury. Falls experienced by the elderly are caused by intrinsic factors, extrinsic factors and situational factors[5].

METHOD

This research is included in a descriptive analytic study with a prospective approach which was conducted in June 2022 at the Kradenan Public Health Center. The population in this study were elderly people at the Kradenan Village Elderly Posyandu in the January-December 2021 period with a total sample of 44 respondents according to the inclusion criteria, namely a) Elderly at the Kradenan Village Elderly Posyandu and can communicate well; b) Actually

attending the Kradenan Village Elderly Posyandu; c) With communication disorders who live with family or with caregivers; d) Willing to be a respondent and exclusion criteria, namely a) Unable to attend Posyandu activities; b) Experiencing a decrease in consciousness using consecutive sampling technique.

Collecting data in this study using medical record data and questionnaires for Falling Risk Assessment in the Elderly. Analysis of the data used is univariate analysis and chi square test. ethical eligibility certificate issued with letter number No.045/EC/KEPK/UNIMUS/2022.

RESULT

Table 1.1 Characteristics of Respondents

Characteristics of Respondents	n	%
Age		
Elderly	35	79,5
Old age	9	20,5
Gender		
Male	17	38,6
Fimale	27	61,4
Marital status		
Widower	11	25,0
Married	33	75,0
Profession		
Work	32	72,2
Doesn't work	12	27,3
History of previous fall		
Ever fall	23	52,3
Never fall	21	47,7
Fall location		
Inside the house	10	43,5
Outdoors	13	56,5
Disease history Hypertension		
Yes	12	27,3
No	32	72,7
Joint pain		
Yes	30	68,2
No	14	31,8
Vertigo		
Yes	17	38,6
No	27	61,4
Visual impairment		
Yes	44	100,0
No	0	0,0

Table 1.2 Fall Risk Level

Fall risk level	n	%
High risk	36	81,0
Low risk	8	18,2

Table 1.3 Fall risk level questionnaire

Fall risk level questionnaire	Score	n	%
Gait disturbances (dragging, stomping, swinging)	4	6	13,6
	0	38	86,4
Dizziness or fainting in an upright position	3	23	52,3
	0	21	47,7
Confusion all the time (example: patient with dementia)	3	11	25,0
	0	33	75,0
Nocturia/Incontinence	3	22	50,0
	0	22	50,0
Intermittent confusion (example: patients with delirium /*Acute confusional state*)	2	16	36,4
	0	28	63,6
Common Weaknesses	2	17	38,6
	0	27	61,4
High-risk drugs	2	3	6,8

(diuretics, narcotics, sedatives, antipsychotics, laxatives, vasodilators, antiarrhythmics, antihypertensives, hypoglycemic drugs, antidepressants, neuroleptics)			
	0	41	93,2
History of falls in the last 2 months	2	5	11,4
	0	39	88,6
Osteoporosis	1	9	20,5
	0	35	79,5
Hearing and/or vision impairment	1	44	100,0
	0	0	0,0
Age 70 years and over	1	11	75,0
	0	33	25,0

DISCUSSION

Age

The percentage of the elderly group is more, namely 79.5%. Increasing age will be at risk of experiencing various health problems caused by the aging factor of the elderly which causes various changes experienced by the elderly both physically, cognitively, and psychologically. Judging from the physical aspect of the decline in the strength of mass, bone, delays in the movement of joints and muscles can be experienced by the elderly. This decrease can cause the ability of the elderly to maintain balance to decrease, so that it becomes one of the factors causing the incidence of falls in the elderly[6].

Marital status

In this study, the percentage of married people is 75% more. This is also found in research conducted by Setyabudi which shows that the percentage of respondents who are married is more (61.5%)[7]. Marital status can affect the incidence of insomnia because if someone sleeps normally with their partner, sleeping alone can result in a state of wakefulness that can cause depression and increase balance disorders in the elderly[8].

Gender

The percentage of the number of women more than men is 61.4%. This is also in line with the research conducted by Sari, Indaryati & Nurjanah which showed that the majority of respondents were female (74.2%)[9]. In women who have entered old age will experience menopause where there is a decrease in the hormone estrogen. Menopause can affect physical condition so that it can increase the risk of falling[10].

Profession

The percentage of respondents who work more is 72.2%. The majority of respondents' jobs are working as farmers. This is not in accordance with research conducted by Suciana, Handayani & Ramadhani which shows that more respondents do not work, namely 73.3%[11]. Work can affect the balance according to the type of work. Physical activity such as work done by the elderly will decrease with age. Doing physical activity can improve balance in the body, strength in muscles, and strong joints so that it can make the elderly avoid the risk of falling[12].

Fall history and Fall location

Respondents with a history of previous falls had a higher number,

namely 52.3% and the location of most falls was outside the home, namely 56.5%. The elderly who have a history of previous falls will be at risk of experiencing repeated falls because falling can cause trauma to the elderly so that they can make the elderly feel afraid[13]. This is also found in research conducted by Arianda Ryan which shows that the elderly who often experience falls more, namely 48.3%[14]. The location of falls in this study is mostly outside the home, this is also found in a study conducted by Sabatini Stefani Natalia which showed that the frequency of the elderly falling and almost falling was on the terrace of the house. The terrace is exposed to rain, the remaining water when drying clothes or watering plants will increase the slippery floor[15].

Disease history

Hypertension

There were fewer respondents with a history of hypertension in this study, namely 27.3%. This was also found in a study conducted by Sari Ranti which showed that respondents with hypertension were less than 24.5%[16]. Hypertension is one of the important factors that play a role in the decline in cognitive function and balance disorders in the elderly[17] With increasing blood pressure, it can affect the ability of perfusion to body tissues including the brain as the center for regulating body balance and awareness[18].

Joint pain

Respondents with joint pain had a higher percentage, namely 68.2%. This was also found in a study conducted by Arden which showed that chronic knee pain was associated with a 50% increase in the risk of falling in the elderly[19]. The elderly who experience disease in the joints are often caused by damage to the surface of the bone joints. Stiffness in the joints that can cause pain in the legs will lead to the inability of the elderly to support their bodies when moving or walking, so that it can cause the elderly to fall[20].

Vertigo

Respondents who did not have a history of vertigo were more, namely 61.4%. In a study conducted by Sarah & Sembiring, it was also found that respondents with a history of vertigo were more than 70.0%[21]. Vestibular disorders can lead to dizziness and vertigo which can affect balance[5]. These abnormalities have a relationship with the balance system in the body which can lead to falls[22].

Visual and hearing impairment

Respondents with visual and hearing impairment were 100.0%. In a study conducted by Ashar Permata also showed that more respondents with visual impairment, namely 63,2%[5]. Elderly people with visual impairment can cause problems in carrying out activities. This can also increase the risk of falling in the elderly. Impaired vision in the elderly can make it difficult to see clearly the state of the surrounding environment so that it can increase the risk of falling in the elderly due to blurred vision[23]. In a study conducted by Sholekah also showed that the majority of the elderly experienced sensorineural hearing loss as much as 48.2% and conductive deafness as much as 33.7%. The decrease in hearing experienced by the elderly occurs due to a decrease in sensorineural function in the inner ear so that it can cause hearing in the elderly to decrease gradually[24].

Fall Risk Level

In this study, the level of high risk of falling in the elderly had a higher percentage, namely 81.8%. This was also found in a study conducted by Rudy & Setyanto which showed that respondents with a high risk of falling were more, as many as 58.3%6. Based on table 1.3, it

shows that dizziness or fainting in an upright position is one of the most influential factors on the results of the assessment in the high risk level of falling as much as 52.3%[25]. This was also found in a study conducted by Rebolo & Barreto which showed that the prevalence of dizziness was 63.03%[26]. Dizziness is a symptom that appears as a result of several clinical disorders that show a direct relationship with changes in balance[27].

Based on table 1.3, it shows that respondents with less gait disturbance are 86.4%. This was also found in a study conducted by Liyanti, Indrawati & Wamaulana showing that fewer respondents with musculoskeletal disorders (51.3%)[23]. The elderly will experience setbacks and changes in muscle shape which can lead to a decrease in muscle function which can lead to a decrease in strength and contraction of the muscles. Musculoskeletal disorders will cause walking disorders and balance disorders that can cause sluggishness in moving, legs that tend to be easily wobbly, decreased ability to anticipate tripping, slipping, and slowed responses that can make the elderly experience falls[28].

In addition, things that can cause a high risk of falling in the elderly are cognitive disorders. Based on table 1.3 shows that respondents who do not experience confusion at any time are more, namely 75.0% and those who do not experience intermittent confusion are more, namely 63.6%. A decline in cognitive function can occur in patients with dementia, where it will increase with age and can cause a higher risk of falling that is twice the risk of falling[29]. Decreased cognitive function can result in decreased ability to maintain balance due to changes that occur in the sensory, motor and central nervous system. This was also found in a study conducted by Sabrina Zasqia which showed that impaired cognitive status contributed (85%) to balance disorders[30].

Based on table 1.3 shows that 50.0% of respondents experienced nocturia/incontinence. In this study, there were more respondents who experienced nocturia than urinary incontinence, as many as 17 respondents. This was also found in a study conducted by Stewart, et al. which showed that the number of men (14.8%) and women (17.9%) who experienced nocturia had fallen in the past year. In someone who experiences nocturia, having to wake up after lying down for a long time and then walking through the house to the bathroom in dim lighting or complete darkness, this is thought to be a risk factor for falls in the elderly[31]. In addition, there are also several problems that are often found in the elderly, one of which is urinary incontinence[20]. Research conducted by Simbolon and Boyoh showed that 100% of respondents suffered from urinary incontinence[32]. Physically, the impact of urinary incontinence in the elderly includes the risk of falling as a result of frequent awakening at night to urinate. Frequent awakenings at night can make the elderly experience fatigue and dizziness[32].

Based on table 1.3 shows respondents with less general weakness, namely 38.6%. In a study conducted by Renner, et al. showed that almost 26% of men were categorized as having higher fatigue, this could lead to a 25% increased risk of falling once over a period of 4 months to 3 years and a 50% higher probability experienced a fall within 1 year[33]. Fatigue has a variety of effects that can occur which can lead to improvements affecting posture, general walking and stride, decreased muscle function and strength and reduced proprioception and/or sensation[34].

Taking medication is also included in the factors that influence the incidence of falls. In this study, respondents by

taking high-risk drugs were fewer, as many as 6.8%. The class of drugs consumed by the respondents in this study was antihypertensive. The use of drugs with inappropriate doses such as psychotropics, diuretics, antihypertensives and antiparkinsonians can cause falls in the elderly by lowering the level of alertness, causing fatigue, dizziness and postural hypotension. In a study conducted by Amrullah Adhi, it was shown that the use of psychoactive drugs was mostly used singly, namely 45.9%[35].

Osteoporosis is also one of the factors that can affect the risk of falling in the elderly. In this study, there were more elderly people who did not have osteoporosis, namely 79.5%. In a study conducted by Silva, et al showed that respondents with osteoporosis were 80.5%[36]. Bone density will decrease, the spine can condense so that it can cause the spine to look shortened and curved. These changes can cause bone fragility so that osteoporosis will occur. This condition can cause bones to become porous and prone to fractures, which can put the elderly at risk of falling[37].

CONCLUSION

Based on the results of the study, it was concluded that the characteristics of respondents at the Kradenan Village Elderly Posyandu were mostly aged 60-74 years, female, still actively working, had a history of falling most of the time outside the home, did not have a history of hypertension, experienced joint pain, did not have a history of vertigo, and experienced visual impairment had a higher level of risk of falling caused by intrinsic factors.

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