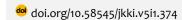Check for updates

Challenges of Elderly Coffee Farmers: Exploring Fall Risks and Associated Hypertension in Alas Lanjang, Bondowoso

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Abstract

Elderly farmers faced high health risks, particularly from Non-Communicable Diseases (NCDs), with hypertension being a significant issue. The elderly were vulnerable to hypertension due to physiological changes affecting their well-being. Hypertension in the elderly increases the risk of falls, which could cause physical injuries and psychological impacts. This study aimed to analyze the characteristics of elderly farmers and describe the fall risk among hypertensive elderly farmers in Blimbing Village, Klabang Subdistrict, Bondowoso Regency. This research used a descriptive quantitative design with a cross-sectional approach. The study population included 90 elderly farmers in Dusun Alas Lanjang, with a sample of 60 hypertensive elderly farmers meeting the inclusion criteria. Data were collected using the Morse Fall Scale questionnaire to assess fall risk and demographic characteristics. The study results indicate that most respondents were 60-74 years old (68.3%), with the majority being female (56.7%). Most respondents had no formal education (61.7%). The most prevalent type of hypertension among respondents was Stage 1 hypertension, with 30 (50%) respondents, and Stage 2 hypertension, with another 30 (50%) respondents. Results from the Morse Fall Scale showed 58 (96.7%) respondents at high risk of falls and 2 (3.3%) respondents at low risk. These findings indicated a high risk of falls among hypertensive elderly farmers in Blimbing Village, necessitating appropriate interventions to prevent falls and related health complications.

Keywords: Elderly, Fall risk, Farmers, Hypertension

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1. BACKGROUND

Indonesia, as an agricultural country, relies heavily on its agricultural sector, which employs a significant portion of the population. Notably, 53.10% of the elderly workforce in Indonesia is engaged in agriculture (Rahmawati et al., 2023). While farming is a vital livelihood, elderly farmers face substantial health challenges, particularly from Non-Communicable Diseases (NCDs) such as hypertension. Studies indicate that the prevalence of

hypertension among farmers and fishermen in Indonesia reaches 25%, with a slightly lower rate of 20.43% reported in East Java (Ministry of Health, 2018).

The aging process brings physiological changes that increase vulnerability to hypertension, significantly impacting physical, psychological, and social well-being (Natalia et al., 2022). Chronic hypertension, especially when persisting for more than three months, can lead to severe complications, including vascular damage, heart attacks, and an elevated risk of falls (Nuzula et al., 2021). Furthermore, reduced physical activity common among elderly individuals can weaken muscle strength and impair balance, further exacerbating the likelihood of falls. Research highlights that falls are a prevalent issue among the elderly, with reported rates of 67.1% in the 65-74 age group and 76.2% in those aged 75 years and above (Agustiningrum et al., 2023).

A preliminary investigation conducted in Alas Lanjang Hamlet, Blimbing Village, revealed alarming findings: all 10 elderly farmers interviewed were diagnosed with hypertension. Their blood pressure levels were associated with symptoms such as dizziness and loss of balance, both of which are critical risk factors for falls. Additionally, data from the Klabang Health Center showed that 25 elderly hypertensive patients routinely visited the local health post, with recorded blood pressure readings of ≥140/80 mmHg. These individuals are particularly vulnerable to falls due to a combination of intrinsic factors (e.g., musculoskeletal disorders, vision impairments) and extrinsic factors (e.g., inadequate lighting, uneven or slippery surfaces) (Rahmawati et al., 2023).

Given these circumstances, there is a pressing need to better understand the interplay between hypertension and fall risks among elderly farmers. This study aims to provide a comprehensive description of the risk of falls among elderly hypertensive farmers in Alas Lanjang Hamlet, Blimbing Village, Klabang District, Bondowoso Regency. By addressing this critical issue, the research seeks to inform targeted interventions that can enhance the safety and well-being of elderly farmers in rural agricultural communities.

2. METHODS

This study employs a quantitative descriptive design with a cross-sectional approach to assess the risk of falls among elderly coffee farmers in Alas Lanjang Hamlet, Blimbing Village, Klabang District,

Bondowoso Regency. The sampling technique utilized is total sampling, which includes all members of the target population meeting the inclusion criteria. The study population consists of 60 elderly coffee farmers who were identified as eligible participants.

The research was conducted in Blimbing Village, Alas Lanjang Hamlet, located in Klabang District, Bondowoso Regency. This location was chosen due to its agricultural significance and the prevalence of hypertension among elderly farmers, as identified in preliminary studies.

Data for this study were collected through two primary sources, with the main method involving direct collection from respondents using the Morse Fall Scale (MFS) questionnaire, a validated tool designed to assess fall risk. The MFS evaluates both intrinsic factors, such as physical condition and health status, and extrinsic factors, like environmental hazards, that contribute to fall risk. The questionnaire consists of six scored items used to determine the overall risk level: scores of 0–24 indicate no risk of falling, 25–50 signify a low risk, and scores ≥51 suggest a high risk of falling.

The Morse Fall Scale has been widely recognized for its validity and reliability in previous research, including studies conducted by Eka Ediawati (2012). As such, no further validity or reliability testing was performed for this instrument.

Secondary Data obtained from the Klabang Health Center, midwives, and village nurses. These data included demographic information and medical records of elderly individuals diagnosed with hypertension in Alas Lanjang Hamlet. Secondary data were used to complement and contextualize the findings derived from the primary data collection.

Ethical approval for this study was obtained from the Faculty of Nursing, University of Jember, with reference number 296 / UN25.1.14 / KEPK / 2024. All participants were informed about the study's objectives, procedures, and confidentiality measures. Written consent was obtained prior to data collection to ensure ethical compliance and respect for participants' autonomy.

The collected data were analyzed descriptively to provide an overview of the fall risk levels among elderly hypertensive coffee farmers. The results were categorized based on the Morse Fall Scale scoring system to identify the proportion of participants classified as having no risk,

low risk, or high risk of falling. This analysis aimed to highlight specific risk factors and inform potential interventions tailored to the needs of elderly farmers in rural agricultural communities.

3. RESULTS

The results obtained in the study were the characteristics of respondents.

Table 1. Characteristics of Hypertensive Elderly Farmer Respondents in Blimbing Village, Klabang District, Bondowoso Regency (n=60)

Respondent Characteristics	Frequency (n)	Percentage (%)
Age		
60-74 years	41	68.3
75-90 years	17	28.3
›90 years	2	3.4
Gender		
Male	26	43.3
Female	34	56.7
Last education		
No school	37	61.6
Elementary school	22	36.7
Senior high school	1	1.7
Hypertension		
Grade 1 Hypertension	30	50.0
Grade 2 Hypertension	30	50.0

Based on the characteristics of the respondents in Table 1, the results of the age value of the majority of respondents are in the age range of 60-74 years, as many as 41 (68.3%). The gender of the elderly farmers with hypertension is primarily female, with as many as 34 (56.7%) than male, as many as 26 (43.3%) respondents. The last education of the majority is not in school, as many as 37 (61.7%). The most hypertension of the respondents is grade 1 hypertension, namely 30 (50%) respondents, and grade 2 hypertension, as many as 30 (50%) respondents.

Table 2. Frequency Distribution of Morse Fall Scale Questionnaire Indicator Values in Elderly Farmers with Hypertension in Coffee Plantations in Blimbing Village, Klabang District, Bondowoso Regency (n=60)

Respondent Characteristics	Frequency (n)	Percentage (%)
Fall History		
Yes	50	83.3
No	10	16.7
Secondary diagnosis		
Yes (Gastritis, Asthma, Blood uric acid levels, Hepatitis A, Hernia, Blood fat levels)	10	16.7
No	50	83.3
Walking aids		

Bed rest or assisted by a nurse	21	35.0
Crutch/ Stick/ Walker	39	65.0
Holding on to objects around (chair, cupboard, table)		
Intravenous therapy		
Yes	0	0.0
No	60	100
Gait/Moving style		
Normal/ bed rest/ immobile (unable to move on their own)	27	45.0
Weak (powerless)	29	48.3
Disorder/abnormal (limping or being dragged)	4	6.7
Mental status		
Elderly are aware of their condition	18	30.0
Elderly have limited memory	42	70.0

Table 2 shows that 50 respondents (83.3%) had a history of falling more than once. In terms of secondary diagnosis, the majority of respondents who had hypertension were 50 respondents (83.3%), who used assistive devices, 21 respondents (35.0%) used canes, and 39 respondents (65.0%) held on to surrounding objects such as chairs, cupboards, and tables. No respondents underwent intravenous therapy. Regarding gait, 27 respondents (45.0%) moved normally or were on bed rest/immobile, 29 respondents (48.3%) were weak, and 4 respondents (6.7%) had walking disorders. Regarding mental status, 18 respondents (30.0%) were aware of their condition, while 42 respondents (70.0%) had memory limitations.

Table 3. Fall Risk Results in Elderly Hypertensive Farmers on Coffee Plantations in Blimbing Village, Klabang District, Bondowoso Regency (n=60).

Morse Falls Scale	Frequency (n)	Percentage (%)
No risk	0	0,0
Low risk	2	3,3
High risk	58	96,7

The risk value of falls in elderly hypertensive farmers was mainly in the high fall risk category, with as many as 58 (96.7%) respondents and low fall risk in as many as 2 (3.3%) respondents.

4. DISCUSSION

Characteristics of Elderly Farmer with Hypertension in Coffee Plantations in Blimbing Village

Alas Lanjang Hamlet, Blimbing Village, is a mountainous area with most of the population being coffee farmers. Many

elderly people still work in this sector due to economic needs, while the younger generation tends to be uninterested and prefers work in the city.

Research shows that most elderly coffee farmers in this hamlet are aged 60-74 years (41 respondents, 68.3%), according to the findings of Rachman et al. (2023) and Brigita et al. (2023), who also recorded the age of the elderly between 60-74 years. Nurfitriani et al. (2021) added that the elderly continue to work in the agricultural sector because the younger generation is less interested and prefers to migrate. The main reasons why the elderly continue to farm include the need for life, low education, poor economic conditions, land use, limited capital, and the belief that farming supports physical health.

According to Rudy (2019), biological factors such as age affect the physical and cognitive abilities and chronic diseases of the elderly, highlighting that the younger generation is not interested in farming work due to wage uncertainty and the time required to earn income. This study shows that the elderly in Alas Lanjang Hamlet are mostly aged 60-74 years, have worked since they were young, and continue to farm due to economic factors and the lack of attractive job alternatives for the younger generation. In this study, there were more female respondents than male respondents.

This finding is in line with the research of Lusiyana (2020), who reported more women than men at the Kedungpoh Posbindu, Gunung Kidul, and Rachman et al. (2023) who noted that the majority of elderly female respondents (21, 60%) at the Tapen Raya Health Center. However, Andriani et al. (2021) reported different results, with more male elderly farmers (142, 57.3%) than female farmers (106, 42.7%) at the Panti Health Center, Jember Regency. Researchers argue that in Alas Lanjang Hamlet, Blimbing Village, the majority of elderly women are elderly because the population of elderly women is more significant, and they continue to work as coffee farmers to meet their daily economic needs and household conditions.

Most respondents had no education, as many as 37 (61.7%), followed by elementary school/equivalent as many as 22 (36.7%), and high school/equivalent as many as 1 (1.7%). This finding differs from the results of research by Rachman et al. (2023), which showed that the majority of respondents had elementary school education (45.7%), and Gusti (2022), which reported that 40.0% of farmers in Dangkel Village and Glapansari Village had less than 6 years of education, with 30% having between 6–9 years of education and 30% more than 9 years.

Agustina et al. (2018) emphasized the importance of education in improving the quality of human resources (HR), which includes the ability to think logically, analytically, systematically, critically, and creatively. Formal education is expected to develop individual potential and produce high-quality HR. However, Rudy (2019) stated that socio-economic factors such as low income and low education, as well as limited access to health services, affect the level of education. The researcher argued that most respondents in Alas Lanjang Hamlet had low education due to economic factors and low awareness of education. The community in Alas Lanjang Hamlet prioritizes earning money for daily needs rather than education. Most respondents experienced grade 1 and grade 2 hypertension, with 30 (50%) respondents each. This finding is consistent with the research of Rachman et al. (2023), which reported that the majority of elderly people experienced grade I (40.0%) and grade II (22.9%) hypertension. However, these results differ from the research of Rahenie et al. (2023), which showed that 53.2% of farm workers experienced grade 1 hypertension and 46.8% grade 2 hypertension. The researcher argued that grade 1 and 2 hypertension in coffee farmers in Alas Lanjang Hamlet were related to medical history, age, and work factors.

Elderly coffee farmers tend not to adopt a healthy lifestyle and rarely visit the health post for blood pressure checks, causing a shift from pre-hypertension to grade 1 and 2 hypertension. Routine blood pressure monitoring at the health post is expected to help control hypertension in coffee farmers.

Overview of Fall Risk in Elderly Farmers with Hypertension in Coffee Plantations in Blimbing Village

Most elderly coffee farmer respondents experienced falls more than once, namely 50 (83.3%). Of this number, some reported falling three times in the last three months, while 10 (16.7%) respondents did not experience falls at all. This finding is in line with the research of Naashiruddiin et al. (2022), which reported that 21.3% of elderly farmers in Bendosari Village had a history of falling once, while 77.7% did not experience falls. However, this result differs from the research of Rasqiyah (2019), which showed that 21.0% of the elderly in Banda Aceh had a history of falls, and 79.0% did not experience falls. According to Sudiartawan et al (2017), environmental factors, such as inadequate housing conditions for the elderly, can increase the risk of falls. Elderly people experience decreased body function that affects daily activities, and home

conditions such as slippery floors, uneven yards, and poor lighting can worsen the risk of falls. Blimbing Village showed that poor environmental conditions, such as damaged roads and slippery red soil, increase the risk of falls.

Researchers argue that the history of falls in elderly coffee farmers in Blimbing Village is caused by decreased musculoskeletal function and environmental conditions that worsen with age and pathological conditions. Elderly people experience decreased muscle strength and flexibility, contributing to an increased risk of falls. The majority of respondents only had a diagnosis of hypertension, including hypertension and gastritis; hypertension and asthma; hypertension and joint pain; hypertension and diabetes mellitus; hypertension and hepatitis; hypertension and hernia; and hypertension and blood fat. This finding is consistent with research by Nina et al. (2020), which showed that the majority of respondents experienced stage 2 hypertension. Research by Lusiyana (2020) also showed that the majority of elderly people experience hypertension. According to Adam (2019), the risk of hypertension increases with age due to changes in the elasticity of the aortic wall, thickening of the heart valves, and decreased ability of the heart to pump blood, as well as increased peripheral vascular resistance. Researchers argue that hypertension can occur at any age, but the risk increases with age. Physiological changes in the elderly contribute to increased peripheral vascular resistance, which is one of the leading causes of hypertension. Therefore, it is important to monitor blood pressure regularly and implement preventive measures such as a healthy diet, regular exercise, and stress management to reduce the risk of hypertension.

In Alas Lanjang Hamlet, Blimbing Village, most elderly coffee farmers hold on to objects around them (walls, chairs, and cupboards), and the rest use canes when walking. This finding is different from the research of Sarah & Sembiring (2021) in Medan City, which showed that most respondents used walking aids such as crutches, canes, or walkers, and the smallest number held on to objects around them. Modok's research (2019) in Depok City reported that 86.5% of respondents did not use walking aids, while 13.5% used canes. Anggarani et al. (2020) found that walkers were a commonly used walking aid. According to Epro et al. (2018), objects around them, such as cupboards and tables, are often chosen because of their availability and ease of access. However, they are not always safe and can increase

the risk of injury if unstable. Using walking aids such as canes and objects around them can help the elderly with difficulty walking maintain balance and reduce the risk of falls.

In this study, all respondents were not given intravenous therapy. The questionnaire used was the Morse Fall Scale, which is commonly used in acute care, both in hospitals and long-term care. These findings indicate that elderly farmers in Alas Lanjang hamlet, Blimbing village, no require intravenous therapy because their health conditions are declared good and do not require such intervention. Most respondents showed a weak gait (no energy); the rest walked usually and experienced disorders (limping). These findings differ from the study by Sarah & Sembiring (2021), in Medan City, where most respondents walked usually, and the rest were tired and experienced disorders (limping). According to Sudiartawan et al. (2017), balance, strength, and flexibility are the main factors in a good walking pattern. Decreased walking ability in the elderly is caused by disorders of the musculoskeletal and nervous systems, including decreased muscle strength, walking speed, and coordination. Researchers argue that decreased balance and overall health in the elderly cause difficulty in walking. Most elderly respondents experienced memory

limitations, as many as 42 (70.0%) respondents, while 18 (30.0%) were aware of their condition. Elderly people with memory limitations often forget the time (hour, date, and month), while those aware of their condition can correctly remember and mention names, places, and times. This finding aligns with research by Sudiartawan et al. (2017), which shows that cognitive factors can increase the risk of falls in the elderly due to degenerative processes that affect cognitive abilities. Decreased cognitive abilities result in difficulty making decisions and taking action, increasing the risk of falls. Researchers argue that cognitive decline in the elderly increases the risk of accidents due to difficulty making decisions and taking action, influenced by environmental factors and musculoskeletal abilities.

Risk Level of Falls

In the risk level of falls in elderly hypertensive coffee farmers at the Alas Lanjang Hamlet Coffee Plantation, Blimbing Village, Klabang District, Bondowoso Regency, the most experienced a high risk of falls, and a relatively small number of those with a low risk of falls and no risk of falls as much. This is in line with research by Hasanah et al. (2023) in Tegal Siwalan Village, Siwalan District, Probolinggo Regency, which

showed that the risk of falls was highest in elderly farmers as many as 10 (55.6%) respondents. However, research by Talhaoui et al. (2022) showed different results, where out of 60 respondents, more than half, namely 37 people (61.7%), were elderly with a mild risk of falls. According to Adliah et al. (2022), falls in the elderly can result in physical limitations, reduced capacity to carry out daily activities, physical damage, injuries such as bruises, abrasions, and sprains, as well as increased treatment costs, and even death. Researchers argue that falls in the elderly are a serious health problem with various negative impacts. Falls among coffee farmers in Alas Lanjang Hamlet can cause significant physical limitations, reduce the capacity of the elderly to carry out daily activities, and increase the risk of physical injuries such as bruises, abrasions, and sprains. Preventing falls in the elderly requires a holistic approach that includes increasing physical activity, regular health evaluations, and environmental modifications.

5. CONCLUSION

Overview of Fall Risk in Elderly Farmers with Hypertension in Coffee Plantations in Blimbing Village, Klabang District, Bondowoso Regency, most of them are in the high fall risk category, with the majority of respondents being female, with the most educational history being no school. The blood pressure in most respondents is hypertension with grade 1. It is hoped that this study can explore factors that further influence the risk of falls experienced, such as intrinsic and extrinsic factors that can result in the risk of falls and become reference information for learning about the risk of falls in elderly farmers and taking preventive measures against the risk of falls and modifying the environment.

AUTHOR CONTRIBUTIONS

The author contributes all research activities. Conceptualization: Nadia Putri Salsabila, Latifa Aini Susumaningrum, and Hanny Rasni. Analysis: Fahruddin Kurdi, and Niken Asih Laras Ati. Writing and manuscript revisions: Nadia Putri Salsabila, and Latifa Aini Susumaningrum,.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest in this research.

DATA AVAILABILITY STATEMENT

The data are available from the corresponding author upon reasonable request.

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