

Fall risk identification in elderly: implementation of screening program at Giriloyo Posyandu

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Abstract

Falls among the elderly pose a significant health risk resulting in injuries, disabilities, and heightened morbidity. Preventive measures can be implemented via early identification through screening initiatives at community health centers (Posyandu Lansia). This community initiative sought to identify fall risks in elderly individuals by utilizing the Functional Reach Test (FRT) and the Timed Up and Go (TUG) test at the Giriloyo Community Health Post. Employing an action research methodology, the phases encompassed planning, execution, monitoring, assessment, and contemplation. The event took place on August 9, 2025, and included 35 senior participants. FRT findings indicated that 9 participants (25.71%) fell into the low category, 22 participants (62.86%) were classified in the moderate category, and 4 participants (11.34%) belonged to the high category. TUG findings indicated that 9 participants (25.71%) were not at risk, 22 participants (62.86%) were at risk, while 4 participants (11.34%) were at very high risk of falling. The majority of elderly fell into the moderate risk category, exhibiting reduced balance and mobility as they aged. This screening effectively recognized fall risk factors early and served as the foundation for education and preventive actions to enhance the quality of life for elderly individuals

Keywords: community health post; elderly; fall risk; screening

1. Introduction

Aging is a continuous process experienced by every individual, bringing about various changes in humans—physiological, mental, psychosocial, and spiritual—that are commonly observed in Elderly (Tiodora & Mulyono, 2022; Renrusuna, Maria, & Firdaus, 2022; as cited in Agustiningrum et al., 2023). This process of aging affects multiple aspects of life, including social, economic, and health domains (Pristianto et al., 2024).

Older adulthood is a stage of life that every individual will experience. Although there is a decline in the function of organs, systems, and body tissues, elderly can still lead fulfilling lives. According to Presidential Regulation Number 88 of 2021 on the National Strategy for Ageing, an older adult (elderly) is defined as a person aged 60 years or older. Globally, the population of Elderly increases every year, making health issues related to aging, including fall risk, an increasingly important concern in the field of public health (Pristianto et al., 2024).

A fall is an incident in which a conscious individual unintentionally ends up on the ground (Siti & Irfan, 2025). According to the World Health Organization (WHO, 2007), the risk of falls among Elderly increases due to age-related declines in physical function, the presence of multiple medical conditions, side effects of medications, and environmental factors such as poor lighting or slippery floors. In several countries, it has been reported that 28–35% of adults aged over 65 experience falls annually, and this rate increases to approximately 32–42% among those over 70. Furthermore, about 40% of these

individuals are reported to experience recurrent falls. In Indonesia, it is estimated that around 30% of community-dwelling elderly experience falls each year (Setiorini, 2021).

Falls are among the most critical health issues faced by elderly, as they can lead to injuries, mobility limitations, and even death. For individuals aged 75 years and older, falls can result in dependency and disability, both physically and mentally. Physically, the effects include head injuries, decreased functional ability, fractures, and, in severe cases, mortality among elderly. Psychologically, the consequences include shock, feelings of fear, loss of confidence, restrictions in daily activities, and fear of falling (Stanley, 2027, as cited in Sarah et al., 2022).

Evans, as referenced in Ang et al. (2020) and Siegle (2024), reported that approximately 30% of individuals with a prior history of falling are at risk of experiencing subsequent falls. The occurrence of falls is strongly associated with a heightened fear of falling, which may precipitate a decline in physical activity, increased anxiety, and depressive symptoms, often resulting from previous falls or near-fall experiences. These findings demonstrate that falls in elderly extend beyond physical health implications, exerting profound effects on psychological well-being and social functioning. The considerable prevalence of falls and the elevated risk of recurrence underscore the necessity of implementing early detection strategies and targeted preventive interventions, such as community-based fall-risk screening initiatives. Such screening programs facilitate the early identification of risk factors, enabling timely and appropriate interventions to mitigate the incidence of falls among Elderly.

Fall-risk screening can be conducted using methods such as the Timed Up and Go (TUG) test and the Functional Reach Test (FRT). The FRT is a widely used assessment tool for evaluating static balance and has demonstrated high test–retest and inter-rater reliability, with excellent internal consistency ($\alpha = 0.82\text{--}0.84$) and statistical significance ($p < 0.0001$) (Komalasari & Amalia, 2024). The Timed Up and Go Test (TUGT) is a fundamental assessment for evaluating functional mobility and has been shown to possess excellent validity and reliability (0.98) (Kim et al., as cited in Nur'Aini et al., 2023).

Based on this rationale, the present study aims to identify fall risk among elderly through the implementation of a screening program utilizing the Timed Up and Go (TUG) test and the Functional Reach Test (FRT) at Giriloyo Posyandu. This screening process is expected to facilitate the early identification of fall risk factors, enabling elderly to receive appropriate interventions and ultimately reducing the frequency of falls. Furthermore, this community service initiative represents a contribution to ongoing efforts to prevent recurrent falls among the elderly population.

2. Method

The implementation of this community service program employed an action research approach consisting of four stages: planning, implementation, observation, and evaluation with reflection. The program was carried out on August 9, 2025, at the Elderly Posyandu of Padukuhan Giriloyo and was attended by a total of 35 elderly.

The initial stages of this activity are outlined as follows:

- a. Coordinating with the elderly Posyandu cadres by seeking permission and explaining the plan for fall-risk screening among elderly in Padukuhan Giriloyo.
- b. Conducting further coordination by informing the cadres about the objectives and procedures of the activity.

This community service activity was carried out through the implementation of fall-risk screening and an intervention involving the distribution of educational leaflets and a brief explanation regarding fall prevention strategies. The activity began with the Functional Reach Test (FRT), which involved adjusting the measuring tool to the participant's height while the participant clenched their fist. The older adult was then instructed to lean forward and reach as far as possible. The measurement was conducted three times, and the final score was recorded to assess the level of fall risk. Subsequently, the Timed Up and Go (TUG) test was administered. In this test, the older adult was asked to sit on a chair, stand up, walk forward ten steps, return to the chair, and sit down again with their back resting against the seat. The total time taken, measured with a timer starting when the participant stood up and ending when they sat down again, served as an indicator of balance and physical mobility. Observations were made to identify challenges, weaknesses, or limitations encountered during the implementation. Evaluation was conducted based on the screening results to determine fall risk levels and to identify

any instances of recurrent falls. Finally, a reflection stage was carried out, during which a brief fall-prevention intervention was delivered through an explanation session and the distribution of leaflets.

3. Results and Discussion

The community service activity involving fall-risk screening for elderly was successfully conducted on August 9, 2025, at the Elderly Giriloyo Posyandu. Following the screening, the results are presented and summarized in the table below.

Table 1. Frequency Distribution of Functional Reach Test (FRT) Results

Category	Frequency	Percentage (%)
Low	9	25.71
Moderate	22	62.86
High	4	11.34
Total	35	100

Table 1 presents the results of the Functional Reach Test (FRT) among elderly in relation to fall risk, showing that 9 participants (25.71%) were categorized as slow risk, 22 participants (62.86%) as moderate risk, and 4 participants (11.34%) as high risk.

Table 2. Frequency Distribution of Timed Up and Go (TUG) Test Results

Category	Frequency	Percentage (%)
Low Fall Risk	9	25.71
Moderate Fall Risk	22	62.86
High Fall Risk	4	11.34
Total	35	100

Table 2 presents the results of the Timed Up and Go (TUG) test among elderly, assessing balance and mobility. The findings show that 9 participants (25.71%) were categorized as having no fall risk, 22 participants (62.86%) as being at risk of falling, and 4 participants (11.34%) as having a very high fall risk.

3.1. Interpretation of Functional Reach Test (FRT) and Timed Up and Go (TUG) Results

Based on the Functional Reach Test (FRT) results from 35 elderly at the Giriloyo Posyandu, 9 participants (25.71%) were classified as low risk, 22 participants (62.86%) as moderate risk, and 4 participants (11.34%) as high risk. These findings indicate that the majority of elderly fall within the moderate category, suggesting that their static balance is relatively adequate but they remain at risk of falling when exposed to triggering factors such as slippery surfaces, inadequate lighting, or fatigue. Conversely, the group categorized as high risk (11.34%) requires additional attention, as they exhibit significant balance impairments, increasing their likelihood of experiencing falls.

The TUG test results demonstrated a similar pattern, with 9 participants (25.71%) categorized as having no fall risk, 22 participants (62.86%) classified as being at risk of falling, and 4 participants (11.34%) identified as having a very high fall risk. These findings highlight that more than half of the respondents (62.86%) are in a vulnerable condition, characterized by reduced mobility, and therefore require further preventive interventions.

An analysis of both the FRT and TUG results shows that the largest proportion of participants (62.86%) fell into the moderate and at-risk categories. This indicates that the majority of elderly at the Giriloyo Posyandu are already experiencing a decline in balance and physical mobility associated with aging. The TUG results further demonstrated a similar trend, with 9 participants (25.71%) categorized as having no fall risk, 22 participants (62.86%) as being at risk of falling, and 4 participants (11.34%) as having a very high fall risk. These findings emphasize that more than half of the respondents (62.86%) are in a vulnerable condition, characterized by reduced mobility, and therefore require targeted preventive interventions.

This aligns with the literature stating that approximately 30% of community-dwelling elderly are at risk of falling each year (Setiorini, 2021). Therefore, these screening results provide an essential

foundation for delivering education and implementing preventive measures to reduce fall risk at an early stage.

3.2. Factors Influencing Fall Risk

Fall risk in elderly can be categorized into intrinsic and extrinsic factors, as outlined below (Fitri Nurhayati et al., 2024):

Table 1. Intrinsic and Extrinsic Factors of Fall Risk in Older Adults

Factor	Aspect	Description/Explanation
Intrinsic Factors Influencing Fall Risk in Elderly	Sex	Hormonal and physiological differences between older men and women influence fall risk. Menopause in older women leads to decreased physical strength and increased vulnerability to falls, whereas andropause in men tends to occur gradually and has less significant effects on physical function. However, sex is considered more of a predisposing factor rather than a direct cause. Older men aged 60–80 years are generally more active, making their fall risk more closely related to activity levels. In contrast, women over the age of 80 are more affected by degenerative changes, which increases their susceptibility to fall-related injuries.
	Gait Impairments	Balance, muscle strength, and body flexibility are essential components for maintaining proper gait patterns. Impairments in the musculoskeletal and nervous systems can lead to postural changes and unstable gait. Elderly commonly experience reduced muscle strength, shorter step length, stooped posture, and diminished coordination, all of which significantly increase their risk of falling.
	Visual Impairments	Aging induces various changes in the visual system, including reduced tear production, alterations in pupil size, impaired accommodation, and lens opacity, which may lead to cataracts. These age-related declines in visual acuity make it difficult for elderly to identify objects in their surroundings, particularly in low-light conditions, thereby increasing the risk of tripping or hesitancy when navigating unfamiliar or unsafe environments.

Factor	Aspect	Description/Explanation
	Polypharmacy	The concurrent use of multiple medications (polypharmacy) may lead to harmful drug interactions and adverse effects, such as dizziness, impaired balance, or loss of consciousness. Elderly are particularly vulnerable due to age-related declines in renal and hepatic function, which affect drug metabolism. However, when medications are administered according to medical guidelines and closely monitored by healthcare professionals, the risk of falls can be minimized.
	Cognitive Impairment	Cognitive decline in elderly can lead to difficulties in decision-making and responding appropriately to environmental stimuli. Although it is not a direct cause of falls, cognitive impairment serves as a predisposing factor, particularly when combined with unsafe environments, motor decline, and complex activities. Elderly are more vulnerable to falls when navigating unfamiliar environments or engaging in activities outside their daily routines.
	Chronic Illnesses	Various medical conditions, such as orthostatic hypotension, diabetes mellitus, stroke, and Parkinson's disease, significantly increase the risk of falls among elderly. For instance, sudden drops in blood pressure upon standing may lead to dizziness, diabetes can contribute to muscle weakness, Parkinson's disease impairs movement coordination, and stroke often results in loss of mobility function. These conditions collectively exacerbate physical limitations in elderly, thereby heightening their vulnerability to falls.
Extrinsic Factors Influencing Fall Risk in Elderly	Home Environment	The design of a home that is not adapted to the needs of elderly can significantly increase the risk of falls. Environmental hazards such as slippery floors, inadequate lighting, steep stairs, and poorly arranged furniture are major

Factor	Aspect	Description/Explanation
		contributing factors. Additionally, difficulties in accessing essential areas—such as beds, chairs, or uneven outdoor surfaces—further elevate the likelihood of falls among elderly.

3.3. Implications of the Screening Program at the Posyandu

Based on the results of the elderly screening program at the Giriloyo Posyandu, the majority of participants were classified as having a moderate fall risk, with several individuals falling into the high-risk category according to the Functional Reach Test (FRT) and Timed Up and Go (TUG) test results. Some elderly recorded TUG times exceeding 10 seconds, indicating reduced balance and mobility. Most of the participants were female, which aligns with existing theories suggesting higher vulnerability to falls due to menopause-related decreases in bone density and muscle strength. Additionally, nearly all screened elderly were over 60 years old, with some above 70 years, highlighting the degenerative processes affecting muscle strength, joint flexibility, and motor coordination. Anthropometric data indicated that some participants had waist circumferences greater than 90 cm, which may increase the risk of balance and mobility impairments and is associated with metabolic conditions such as diabetes and hypertension. Health assessments, including blood glucose and cholesterol measurements, also revealed chronic conditions that further elevate fall risk, compounded by the potential effects of polypharmacy from routine medication use, which may cause dizziness and coordination difficulties. Although visual conditions were not directly assessed, age-related visual impairments, such as presbyopia or cataracts, are likely to contribute to tripping and falling.

External factors related to the traditional home environment, including uneven floors or yards, poor lighting, and furniture that is not elderly-friendly, further increased the potential for accidents. Overall, the classification of moderate to high fall risk among elderly at the Giriloyo Posyandu aligns with literature indicating that fall risk is influenced by a combination of intrinsic factors (sex, age, balance impairments, chronic illnesses) and extrinsic factors (home environment). Therefore, fall prevention strategies should consider both individual health conditions and environmental modifications.

3.4. Comparison with Previous Studies

Previous studies conducted by Pristianto et al. (2024) focused on interventions such as stability exercises and elderly exercise programs to improve balance and reduce fall risk, whereas the study by Komalasari & Amalia (2024) emphasized fall-risk detection using the reliable Functional Reach Test (FRT) combined with balance training. In contrast, the present study was conducted in a community setting through the Elderly Posyandu, employing a fall-risk screening approach using a combination of two instruments, namely the Functional Reach Test (FRT) and the Timed Up and Go (TUG) test. This approach provides a more comprehensive overview of the balance and physical mobility conditions of elderly.

3.5. Study Limitations

The implementation of this community service program was subject to several limitations. First, the sample size involved in the activity was limited to 35 elderly, which restricts the generalizability of the findings to the broader elderly population in Giriloyo or other regions. Second, the fall-risk screening was limited to two assessment methods, namely the Functional Reach Test (FRT) and the Timed Up and Go (TUG) test, which may not capture all dimensions of fall risk comprehensively. Third, the program did not include long-term follow-up, preventing an assessment of the effectiveness of interventions in reducing fall incidence over time. These limitations should be acknowledged given the restricted scope of the study and may serve as considerations for future community-based fall-risk screening programs with a broader coverage.

4. Conclusion

The community service program involving fall-risk screening for elderly at the Giriloyo Posyandu was successfully implemented using two instruments: the Functional Reach Test (FRT) and the Timed Up and Go (TUG) test. The screening results indicated that the majority of participants (62.86%) were classified as having a moderate fall risk in terms of both balance and mobility. Additionally, some elderly were identified as high-risk, requiring further attention and intervention. These findings suggest that most elderly at the Giriloyo Posyandu are beginning to experience declines in balance and mobility associated with the aging process, which is consistent with literature reporting that approximately 30% of elderly are at risk of falling each year. Through this screening, fall-risk factors can be identified at an early stage, providing a foundation for education and preventive strategies to reduce the recurrence of falls. The program also highlights the importance of Posyandu as a platform for early detection and community health education, contributing to the improvement of elderly' quality of life.

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