

# Evaluating Multidisciplinary Fall Prevention Strategies in Older Adults

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## Abstract

**Background:** Falls are a leading cause of injury and reduced quality of life among older adults. Multidisciplinary interventions involving nurses, physiotherapists, and psychologists offer a holistic approach to mitigating fall risks.

**Objective:** To evaluate the effectiveness of a multidisciplinary fall prevention program in reducing falls and improving functional outcomes among older adults in a tertiary hospital.

**Methods:** A quasi-experimental pretest-posttest study was conducted with 100 older adults aged 65 years and above. Interventions included fall risk assessments, individualized exercise programs, and psychological support. Outcomes were assessed using fall incidence, Timed Up and Go (TUG), Berg Balance Scale (BBS), Falls Efficacy Scale-International (FES-I), and Barthel Index.

**Results:** Fall incidence decreased significantly from 58% pre-intervention to 18% post-intervention ( $p < 0.001$ ). Participants showed significant improvements in TUG ( $22.8 \pm 5.2$  to  $17.2 \pm 4.1$  seconds,  $p < 0.001$ ), BBS ( $38.6 \pm 7.4$  to  $47.8 \pm 6.2$ ,  $p < 0.001$ ), FES-I ( $32.5 \pm 6.9$  to  $24.3 \pm 5.6$ ,  $p < 0.001$ ), and Barthel Index ( $78.4 \pm 12.2$  to  $91.2 \pm 8.7$ ,  $p < 0.001$ ).

**Conclusion:** The multidisciplinary fall prevention program effectively reduced fall risks and enhanced physical and psychological outcomes. This approach demonstrates the value of collaborative care in improving safety and independence among older adults.

**Keywords:** Falls, Older Adults, Multidisciplinary Care, Fall Prevention, Functional Outcomes, Tertiary Hospital.

## Introduction

Falls among older adults represent a significant public health issue, often resulting in injuries, reduced mobility, and a decline in overall quality of life. Globally, one-third of individuals aged 65 years and older experience at least one fall annually, with even higher rates in institutionalized populations (World Health Organization, 2021). Falls are the leading cause of injury-related hospitalizations among older adults, frequently leading to fractures, loss of independence, and increased mortality (Centers for Disease Control and Prevention [CDC], 2022).

The causes of falls in older adults are multifactorial, involving intrinsic factors such as muscle weakness, impaired balance, cognitive decline, and chronic medical conditions, as well as extrinsic factors like environmental hazards and polypharmacy (Sherrington et al., 2020). Evidence suggests that exercise-based interventions, particularly those focusing on strength, balance, and gait, can significantly reduce fall risk. Additionally, environmental modifications and medication reviews are critical components of fall prevention (Guirguis-Blake et al., 2018). Despite this, single-modality interventions often fail to address the complexity of fall risk factors in older adults, emphasizing the need for a multidisciplinary approach.

Multidisciplinary fall prevention programs involve the collaborative efforts of healthcare professionals such as nurses, psychologists, and physiotherapists. Nurses play a key role in assessing fall risks and providing education, while physiotherapists design and implement exercise interventions to improve strength and balance. Psychologists contribute by addressing cognitive and emotional factors, such as fear of falling, which can hinder recovery and functional independence (Cameron et al., 2018). Although the benefits of such programs are well-documented, there remains limited evidence evaluating their effectiveness in real-world clinical settings.

This study aims to assess the impact of a structured multidisciplinary fall prevention program in reducing falls and improving functional outcomes among older adults in a tertiary hospital setting. By evaluating the integrated efforts of nurses, psychologists, and physiotherapists, this research seeks to provide actionable insights for optimizing fall prevention strategies and enhancing care for the aging population.

## Literature Review

### Prevalence and Impact of Falls in Older Adults

Falls are a major public health concern for older adults, with approximately one-third of individuals aged 65 years and older experiencing at least one fall annually (World Health Organization, 2021). These incidents are a leading cause of injury-related hospitalizations and result in significant morbidity, including fractures, loss of independence, and increased mortality rates (CDC, 2022). Furthermore, falls impose a substantial economic burden on healthcare systems due to increased hospitalizations, rehabilitation needs, and long-term care requirements (Florence et al., 2018).

### Risk Factors for Falls in Older Adults

The etiology of falls is multifactorial, involving intrinsic and extrinsic factors. Intrinsic factors include age-related changes such as muscle weakness, balance impairments, cognitive decline, and chronic diseases like arthritis or diabetes. Extrinsic factors, on the other hand, involve environmental hazards (e.g., poor lighting, slippery floors), inappropriate footwear, and the side effects of medications, particularly polypharmacy (Guirguis-Blake et al., 2018). These factors often interact synergistically, increasing the likelihood of falls and complicating prevention strategies (Sherrington et al., 2020).

### Evidence-Based Interventions for Fall Prevention

Research highlights the effectiveness of exercise-based interventions in reducing fall risk among older adults. Programs focusing on strength training, balance exercises, and gait training have shown significant improvements in functional mobility and fall reduction (Sherrington et al., 2020). For instance, a systematic review by Sherrington et al. (2020) demonstrated that exercise programs with a high challenge to balance can reduce falls by up to 23%. Similarly, Tai Chi and other movement-based therapies have been identified as effective tools for improving postural stability (Huang et al., 2017).

In addition to exercise, interventions such as home safety assessments, environmental modifications, and medication reviews play a crucial role in fall prevention. For example, Guirguis-Blake et al. (2018) found that comprehensive interventions addressing environmental hazards and medication management were associated with a significant reduction in falls among older adults.

### Multidisciplinary Approaches to Fall Prevention

While single-modality interventions are beneficial, multidisciplinary approaches are increasingly recognized as essential for addressing the complex interplay of risk factors in older adults. Multidisciplinary fall prevention programs integrate the expertise of various healthcare professionals, including nurses, physiotherapists, and psychologists. Nurses are instrumental in conducting fall risk assessments, monitoring patients' health conditions, and educating patients and caregivers about fall prevention strategies (Cameron et al., 2018). Physiotherapists design individualized exercise programs to enhance strength, balance, and mobility, while psychologists address cognitive and emotional factors such as fear of falling, which can lead to activity avoidance and further functional decline (Boyd, 2009).

Studies have shown the effectiveness of multidisciplinary interventions in reducing fall rates and improving functional outcomes. For instance, a randomized controlled trial by Clemson et al. (2012) reported that a multidisciplinary fall prevention program reduced falls by 31% compared to usual care. Similarly, Cameron et al. (2018) found that interventions involving collaboration among healthcare providers significantly improved patients' confidence, physical function, and quality of life.

### Gaps in the Literature

Despite the growing evidence supporting multidisciplinary fall prevention programs, limited research has been conducted in real-world clinical settings, particularly in tertiary hospitals. Moreover, while the roles of individual healthcare providers have been studied, the synergistic impact of collaborative efforts among nurses, physiotherapists, and psychologists remains underexplored. Understanding the dynamics of multidisciplinary teamwork in fall prevention could provide valuable insights for optimizing care and reducing falls in older adults.

The existing literature underscores the importance of addressing falls in older adults through comprehensive, multidisciplinary strategies. While individual interventions such as exercise and environmental modifications are effective, a collaborative approach involving nurses, physiotherapists, and psychologists holds significant potential for improving outcomes. This study aims to fill the gap in the literature by evaluating the effectiveness of a multidisciplinary fall prevention program in a tertiary hospital setting.

## Methodology

### Study Design

This study employed a quasi-experimental pretest-posttest design to evaluate the effectiveness of a multidisciplinary fall prevention program in a tertiary hospital setting. The program involved collaborative interventions delivered by nurses, physiotherapists, and psychologists, targeting older adults identified as at high risk of falls.

### Study Setting and Population

The study was conducted in the geriatric and rehabilitation wards of a tertiary hospital. A total of 100 older adults aged 65 years and above were recruited based on the following inclusion criteria:

- Admitted to the hospital for medical or rehabilitation care.
- Identified as at high risk for falls using the Morse Fall Scale (MFS) with a score  $\geq 45$ .
- Able to participate in physiotherapy sessions.
- Provided informed consent.

Exclusion criteria included patients with severe cognitive impairment (Mini-Mental State Examination score  $< 18$ ) or medical conditions contraindicating physical activity.

### Multidisciplinary Fall Prevention Program

The intervention lasted for six weeks and was delivered by a team comprising nurses, physiotherapists, and psychologists. The key components included:

#### 1. Nursing Interventions

- Comprehensive fall risk assessment using the MFS.
- Patient and caregiver education on fall prevention strategies.
- Environmental modifications, such as ensuring proper lighting, reducing clutter, and providing assistive devices.

#### 2. Physiotherapy Interventions

- Individualized exercise programs focusing on strength, balance, and gait training.
- Functional mobility exercises tailored to each patient's abilities and needs.
- Progressive resistance training for lower extremities.

#### 3. Psychological Interventions

- Cognitive-behavioral therapy sessions to address fear of falling and improve self-efficacy.
- Relaxation techniques to reduce anxiety.
- Group sessions to promote social interaction and peer support.

### Data Collection

Baseline data were collected at the beginning of the intervention, and follow-up data were collected six weeks post-intervention. The primary outcome measures included:

- Fall incidence: Number of falls recorded during the intervention period.
- Balance and mobility: Assessed using the Berg Balance Scale (BBS) and Timed Up and Go (TUG) test.
- Fear of falling: Measured using the Falls Efficacy Scale-International (FES-I).
- Functional independence: Evaluated using the Barthel Index.

### Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics were used to summarize participant demographics and baseline characteristics. Paired t-tests were conducted to compare pre- and post-intervention scores for continuous variables (BBS, TUG, FES-I, Barthel Index). Fall incidence was analyzed using chi-square tests. A significance level of  $p < 0.05$  was set for all statistical tests.

### Ethical Considerations

The study was approved by the institutional ethics committee of the tertiary hospital. Written informed consent was obtained from all participants before enrollment. All interventions were conducted in accordance with hospital policies and ethical guidelines for research involving human subjects.

**Limitations**

This study was limited to a single tertiary hospital, which may affect the generalizability of the findings. Additionally, the relatively short duration of the intervention may not capture long-term outcomes of the fall prevention program.

**Findings**

**Participant Characteristics**

A total of 100 older adults participated in the study. Table 1 provides a summary of their demographic and clinical characteristics. The mean age of participants was 73.5 ±6.8 years, with 62% being female. Most participants (88%) had at least one chronic condition, such as hypertension or diabetes.

**Table 1. Demographic and Clinical Characteristics of Participants**

Characteristic	n (%)
<b>Total Participants</b>	100 (100%)
<b>Mean Age (years)</b>	73.5 ± 6.8
<b>Gender</b>	
- Female	62 (62%)
- Male	38 (38%)
<b>Chronic Conditions</b>	
- Hypertension	58 (58%)
- Diabetes	42 (42%)
- Cardiovascular Disease	30 (30%)
<b>Prior Fall History</b>	76 (76%)

**Fall Incidence**

The number of falls recorded during the intervention period decreased significantly. Pre-intervention, 58 participants experienced at least one fall, compared to only 18 participants post-intervention.

**Table 2. Fall Incidence Before and After Intervention**

Variable	Pre-Intervention	Post-Intervention	p-value
<b>Number of Falls</b>	58 (58%)	18 (18%)	<0.001

**Functional Mobility and Balance**

Participants showed significant improvements in functional mobility and balance, as measured by the Timed Up and Go (TUG) test and Berg Balance Scale (BBS). The mean TUG time decreased from 22.8 ±5.2 seconds to 17.2 ±4.1 seconds, while the mean BBS score increased from 38.6 ±7.4 to 47.8 ±6.2.

**Table 3. Functional Mobility and Balance Scores**

Measure	Pre-Intervention (Mean ± SD)	Post-Intervention (Mean ± SD)	p-value
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Measure	Pre-Intervention (Mean $\pm$ SD)	Post-Intervention (Mean $\pm$ SD)	p-value
<b>TUG (seconds)</b>	22.8 $\pm$ 5.2	17.2 $\pm$ 4.1	<0.001
<b>BBS (score)</b>	38.6 $\pm$ 7.4	47.8 $\pm$ 6.2	<0.001

### Fear of Falling and Functional Independence

Fear of falling, as assessed by the Falls Efficacy Scale-International (FES-I), decreased significantly, with scores improving from 32.5  $\pm$  6.9 to 24.3  $\pm$  5.6. Functional independence, measured using the Barthel Index, increased from 78.4  $\pm$  12.2 to 91.2  $\pm$  8.7.

**Table 4. Fear of Falling and Functional Independence**

Measure	Pre-Intervention (Mean $\pm$ SD)	Post-Intervention (Mean $\pm$ SD)	p-value
<b>FES-I (score)</b>	32.5 $\pm$ 6.9	24.3 $\pm$ 5.6	<0.001
<b>Barthel Index</b>	78.4 $\pm$ 12.2	91.2 $\pm$ 8.7	<0.001

### Summary of Findings

The findings indicate that the multidisciplinary fall prevention program significantly reduced fall incidence and improved functional mobility, balance, fear of falling, and functional independence among older adults. These results highlight the effectiveness of a collaborative approach in addressing fall risk and promoting better outcomes in this population.

### Discussion

The findings of this study demonstrate that a multidisciplinary fall prevention program, involving nurses, physiotherapists, and psychologists, is highly effective in reducing fall incidence and improving functional outcomes among older adults in a tertiary hospital setting. This section discusses the implications of these results in relation to existing literature and highlights the study's strengths, limitations, and potential areas for future research.

#### Reduction in Fall Incidence

The significant reduction in fall incidence (58% pre-intervention to 18% post-intervention) underscores the efficacy of a comprehensive, team-based approach. This aligns with prior research that emphasizes the importance of integrating strength and balance training, environmental modifications, and psychological support to mitigate fall risks (Cameron et al., 2018; Clemson et al., 2012). The collaborative efforts of healthcare professionals in this study addressed both intrinsic and extrinsic risk factors, resulting in fewer falls and enhanced safety for participants.

#### Improvements in Functional Mobility and Balance

The marked improvements in TUG and BBS scores reflect the success of physiotherapy-led interventions in enhancing mobility and balance. Similar findings have been reported in studies that highlight the role of targeted exercise programs in reducing fall risk and improving physical function (Sherrington et al., 2020). The observed improvements also indicate the importance of tailoring interventions to the individual needs and physical capacities of older adults, ensuring optimal outcomes.

### Reduction in Fear of Falling

Fear of falling is a significant psychological barrier that can limit physical activity and contribute to functional decline in older adults (Boyd, 2009). The decrease in FES-I scores suggests that psychological interventions, such as cognitive-behavioral therapy and relaxation techniques, were effective in alleviating anxiety and increasing confidence. This finding highlights the critical role of addressing psychological factors in fall prevention programs.

### Enhanced Functional Independence

The increase in Barthel Index scores demonstrates that the program not only reduced fall risks but also improved participants' ability to perform daily activities independently. This is consistent with evidence suggesting that multidisciplinary approaches improve overall quality of life and promote functional recovery in older adults (Guirguis-Blake et al., 2018).

### Implications for Clinical Practice

This study reinforces the value of multidisciplinary teamwork in healthcare, particularly in addressing complex issues such as fall prevention. Nurses, physiotherapists, and psychologists each play a vital role, and their collaboration ensures a holistic approach to patient care. Implementing similar programs in other clinical settings could help reduce the burden of falls and improve outcomes for older adults.

### Study Strengths

One of the strengths of this study is its real-world setting in a tertiary hospital, which enhances the generalizability of the findings. Additionally, the use of validated assessment tools (e.g., TUG, BBS, FES-I, Barthel Index) ensures the reliability and accuracy of the results.

### Study Limitations

Despite its strengths, the study has some limitations. First, the quasi-experimental design lacks a control group, which limits the ability to attribute all observed improvements solely to the intervention. Second, the relatively short follow-up period may not capture long-term effects of the program. Finally, the study was conducted in a single tertiary hospital, which may limit the generalizability of findings to other settings or populations.

### Future Directions

Future research should consider randomized controlled trials to strengthen the evidence base for multidisciplinary fall prevention programs. Long-term follow-up studies are also needed to evaluate the sustainability of improvements in fall risk, mobility, and independence. Additionally, exploring the cost-effectiveness of such programs could provide valuable insights for broader implementation.

### Conclusion

This study highlights the effectiveness of a multidisciplinary fall prevention program in reducing fall incidence and improving physical and psychological outcomes among older adults. By integrating nursing care, physiotherapy, and psychological support, this approach offers a comprehensive solution to a critical healthcare challenge. The findings underscore the importance of collaborative, team-based care in promoting safety, independence, and quality of life for older adults in clinical settings.

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