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Implementing a multidisciplinary fall prevention model in primary care: outcomes from a geriatric fall clinic

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Abstract

Background: **Falls are a leading cause of injury and mortality among older adults; however, structured fall prevention programs are underutilized in primary care. This study evaluated the implementation and effectiveness of a multidisciplinary geriatric fall clinic embedded within a primary care setting, focusing on fall reduction, injury prevention, functional improvement, and patient-centered outcomes.**

Methods: **This prospective observational study included adults at least 60 years of age who completed baseline and 6-month follow-up assessments at a primary care–based geriatric fall clinic. A multidisciplinary team conducted comprehensive fall risk assessments and implemented individualized interventions, including medication review and deprescribing, osteoporosis management, nutritional optimization, and dementia care coordination. Patients with visual, musculoskeletal, or neurological issues were fast-tracked to appropriate specialists. Primary and secondary outcomes, including fall incidence, injury rates, functional mobility, and patient/caregiver satisfaction, were assessed at baseline and follow-up.**

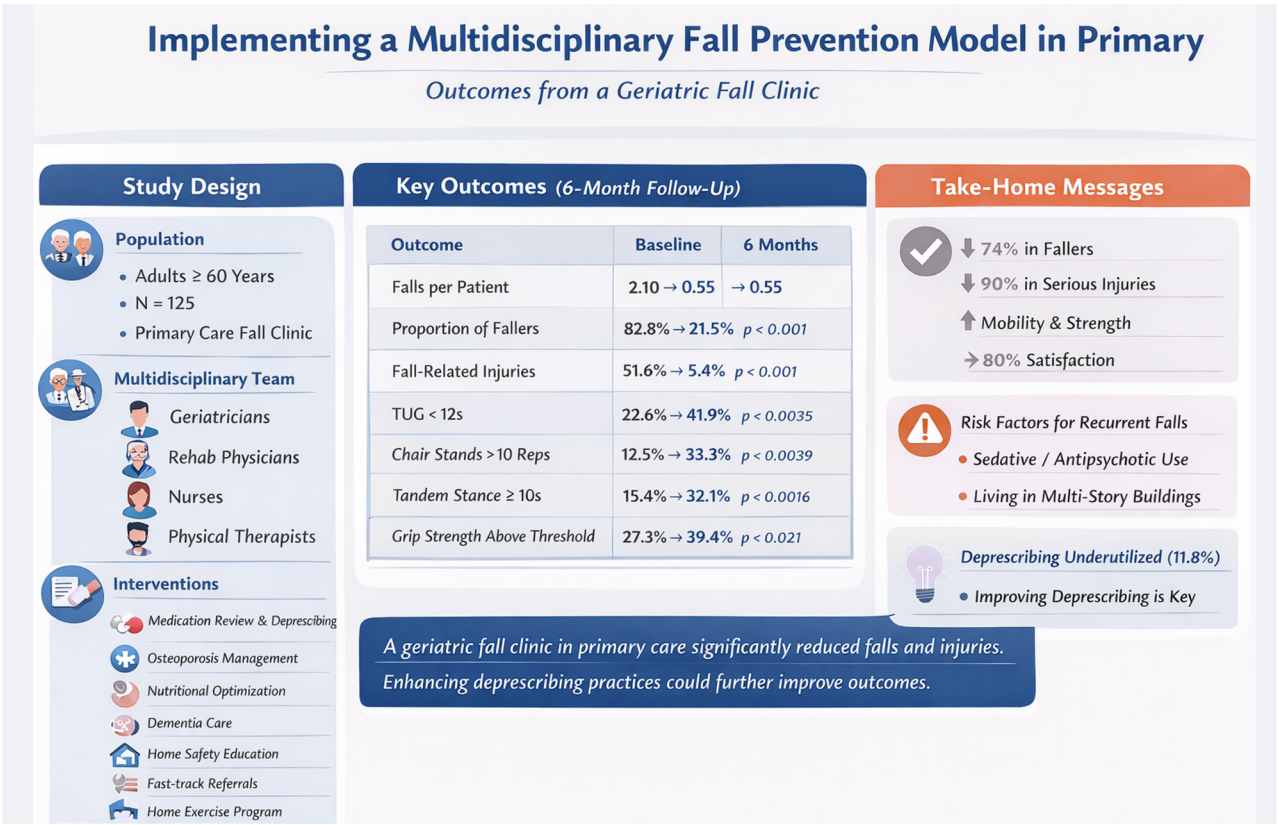
Results: **After 6 months, the mean number of falls per patient declined significantly (2.10 ± 3.49 to 0.55 ± 2.22, $P < .001$), and the proportion of fallers dropped from 82.8% to 21.5% ($P < .001$). Fall-related injuries decreased from 51.6% to 5.4% ($P < .001$). Functional mobility improved across the following indicators: Timed Up and Go (22.6% to 41.9%, $P = .0035$), 30-second chair stand (12.5% to 33.3%, $P = .0039$), tandem stance (15.4% to 32.1%, $P = .0016$), and handgrip strength (27.3% to 39.4%, $P = .021$). Over 80% of patients and caregivers reported high satisfaction with the clinic. Risk factors for recurrent falls included sedative/antipsychotic use and residence in multistory commercial buildings.**

Conclusion: **Embedding a multidisciplinary fall prevention clinic within primary care is a feasible and effective strategy for improving safety, mobility, and satisfaction among older adults. Key strategies for managing fall risk in this population include deprescribing sedative and antipsychotic medications and providing targeted education on home safety. These findings support the broader integration of fall prevention services into routine care to promote early identification and targeted interventions for fall risk.**

Keywords fall prevention, geriatric fall clinic, multidisciplinary, primary care

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Graphical abstract



Introduction

Falls, as the leading cause of accidental-related mortality among older adults, represent a significant public health concern. Approximately 30% of community-dwelling individuals aged 65 and older experience falls annually [1]. The rise of multimorbidity, polypharmacy, and frailty among older adults further increases the risks of falls and related injuries [2, 3]. To address this global issue, medical societies have developed clinical guidelines for fall prevention and management [4–11] that recommend risk stratification, gait and balance assessments, management of fractures and osteoporosis, medication reviews, exercise, environmental modifications, vision, and footwear correction, and physiotherapy referrals.

Fall clinics provide a structured approach to managing older adults at risk of falls by addressing modifiable risk factors. Existing studies [12–17] indicate that these clinics can significantly reduce fall rates while improving balance and physical function. However, because most studies were conducted in specialized, hospital-based, or tertiary settings, the implementation of interventions was often deferred to general practitioners. For example, one study in Australia [15] reported significant reductions in falls but also highlighted under-management of many high-risk patients before their initial clinic assessment. A need remains for more accessible screening and intervention programs, especially in primary care.

Primary care serves as the first point of contact for older adults with health concerns; therefore, it can deliver comprehensive care that addresses patients' beliefs, concerns, and individual needs. Successful implementation of multifactorial fall prevention programs depends on behavioral changes among healthcare professionals, patient engagement, and effective integration into routine clinical practice, consistent with other quality improvement initiatives in healthcare [18]. Ensuring that older adults receive adequate fall risk assessments and interventions in primary care settings is crucial for bridging the gap between evidence-based strategies and real-world practice [13].

Multifactorial fall prevention programs require a coordinated approach involving multiple steps and interventions. The Family Medicine outpatient clinic that served as the setting for this study is a primary care facility that delivers continuous care to older adults and offers a specialized geriatric training program. The geriatric fall clinic, established in January 2021, is integrated into this primary care environment and operates as a multidisciplinary team comprising family physicians specializing in geriatrics, rehabilitation physicians, neurologists, physical therapists, and nurses. The clinic also collaborates with neurosurgeons, orthopedic surgeons, ophthalmologists, and home health care nurses. This integration supports streamlined referrals, care continuity, and individualized fall prevention aligned with patients' clinical complexity. This study aimed to evaluate the pre-post effects of attending our primary care geriatric fall clinic, focusing on fall rates and serious fall-related injuries, as well as the clinic's impact on mobility and patient and caregiver satisfaction.

Materials and methods

Setting and participants

This prospective observational study was conducted from May 2023 to December 2024 at our geriatric fall clinic embedded within a primary care facility. The clinic was implemented within an academic primary care practice that provides longitudinal care for older adults and serves as a teaching site for family medicine residents. Participants included adults aged 60 years or older, consistent with the national definition of the elderly as outlined by the Ministry of Public Health [19] and regional guidelines from the World Health Organization for Southeast Asia [20]. Patients were referred to the clinic from multiple sources (family physicians, medical and surgical outpatient departments, and home health care services). Nurses in the family medicine outpatient clinic conducted routine fall risk screening using the STEADI (Stopping Elderly Accidents, Deaths, and Injuries) algorithm [21]. Patients were recommended for further evaluation if they answered "yes" to any of the key screening questions: (i) a fall in the past year, (ii) unsteadiness while standing or walking, or (iii) worrying about falling.

For eligibility, patients (or their caregivers) had to consent to participate and meet at least one of the following criteria: a history of multiple falls, a single fall with additional risk factors, established gait disturbances requiring gait aids, reported unsteadiness while standing or walking, or expressed fear of falling.

The study was approved by the Human Research Ethics Committee of the Faculty of Medicine. Written informed consent was obtained from all participants or their legally authorized representatives.

Falls and injurious falls

A fall [4] was defined as an "unexpected event in which the participant comes to rest on the ground, floor, or another lower level." Injurious falls included those complicated by serious or moderate injuries. Falls with serious injuries [22] involved fractures, head injuries, hospital admissions, joint dislocations, sprains with reduced physical function, other unspecified serious joint injuries, and lacerations requiring sutures. Falls with moderate injuries [22] resulted in bruising, sprains, cuts, abrasions, or a reduction in physical function for at least 3 days or required medical help.

Falls risk

We classified fall risk for all patients using the STEADI algorithm, a standardized tool for integrating fall assessment and management [21]. Individuals at low risk were those with no history of falls in the past year and no gait or balance impairments. Moderate-risk individuals had a history of one fall in the past year without injury and no gait problems, as indicated by their ability to complete the Timed Up and Go (TUG) test in <12 s [23]. High-risk individuals had a history of two or more falls within 6 months, a fall resulting in moderate to serious injuries, or a fall with associated gait impairment within the past year.

Hand grip strength, gait velocity, and sarcopenia

Grip strength (kg) was assessed using a Jamar Hand Dynamometer, with the highest value recorded from three attempts. Gait velocity was measured as the time taken to walk 6 m, expressed in meters per second. Possible sarcopenia was defined as meeting at least one of the following criteria: gait speed < 0.8 m/s, grip strength < 18 kg in females or < 28 kg in males [24].

Multidisciplinary fall risk assessment and interventions

All patients underwent a comprehensive fall risk assessment conducted by a multidisciplinary team. Details of the assessment and intervention are provided in Supplementary Appendices S1–S4.

1. Visual and Orthostatic Blood Pressure Assessment: Distance visual acuity was evaluated using a Snellen eye chart. Trained nurses measured orthostatic blood pressure in both sitting and standing positions at 1- and 3-min intervals.
2. Gait and Balance Evaluation: A physiotherapist conducted a 20-min functional assessment, including the TUG test, 30-s chair stand test, 4-stage balance test, 6-m gait speed test, and handgrip strength test.
3. Rehabilitation Assessment: Rehabilitation physicians performed a 30-min review of fall history and assessed musculoskeletal and neurological contributors to falls. Patients were then prescribed either physiotherapy sessions (1–2 times weekly for 3–6 months) or a home-based exercise program. Findings and treatment plans were communicated to the family physicians specializing in geriatrics.
4. Comprehensive Geriatric Assessment: Family physicians specializing in geriatrics conducted a 40-min evaluation that included fall history, medication review, comorbidities, and a physical examination. Other investigations (e.g. blood tests and dual-energy X-ray absorptiometry) were ordered to identify conditions like osteoporosis, sarcopenia, dementia, or metabolic abnormalities.

Interventions were classified into six components and tailored to individual patient needs:

1. Medication Adjustments: Deprescribing or modifying fall-risk–increasing drugs.
2. Management of Intrinsic Risk Factors: Including osteoporosis treatment, vitamin D supplementation, nutritional counseling to address sarcopenia, and dementia management.
3. Fast-Tracked Specialist Referrals:
   a. Patients with visual impairment (visual acuity ≥20/70) were fast-tracked to ophthalmologists.
   b. Those with degenerative joint diseases (e.g. cervical spondylosis with myelopathy, lumbar spinal stenosis, advanced knee osteoarthritis) were referred to neurosurgeons or orthopedic surgeons.
   c. Patients with intermediate-stage Parkinson's disease or Parkinson-plus syndromes were expedited to a neurologist member of the clinic's multidisciplinary team.

4. Home-Based Exercise Program: Physical therapists provided structured instructions and a logbook for tracking adherence.
5. Patient and Caregiver Counseling: Counseling focused on educational materials and video resources and on the use of gait aids, proper footwear, fall precautions, and home safety.
6. Home Visits for Environmental Modifications: Patients whose falls were linked to home hazards received targeted support and environmental modification recommendations from a home health care team.

Follow-up and satisfaction assessment

Follow-up visits were scheduled within 30–60 days after the initial assessment to re-evaluate fall risk and monitor interventions. Final assessments were conducted ∼6 months after the baseline visit.

Patient and caregiver satisfaction with the program was evaluated using a structured five-point Likert scale questionnaire developed for this study. The questionnaire had three domains: (i) the clinic environment and duration of services, (ii) the perceived competence and professionalism of the multidisciplinary team, and (iii) the overall quality and satisfaction with the fall clinic.

All clinical and satisfaction data were recorded in electronic medical records and managed using REDCap (Research Electronic Data Capture), a secure, web-based platform designed to support standardized data entry, real-time data validation, and automated export for statistical analysis.

Main outcome measure

The primary outcome was the number of falls during the 6 months following the clinic visit compared to the 6 months prior. Secondary outcomes included the number of serious fall-related injuries, mobility, and patients' or caregivers' satisfaction with the program. The serious fall-related injuries were also captured through medical records.

Primary and secondary outcomes data were collected using the same processes and tools as the baseline assessments. Participants who missed the 6-month in-person visit were contacted by telephone to collect self-reported data on falls, injuries, and satisfaction. These individuals were not included in the analyses of physical performance outcomes.

Statistical analyses

Descriptive statistics summarized demographic, clinical, and biochemical data. Differences between baseline and 6-month follow-up were assessed using paired *t*-tests or Wilcoxon signed-rank tests, as appropriate. Categorical variables (e.g. number of falls, serious injuries) were compared using McNemar's test. Stepwise multivariate logistic regression identified independent predictors of fall outcomes, including variables with $P < .10$ in univariate analyses. Results are reported as odds ratios (ORs) with 95% confidence intervals (CIs). A P-value < 0.05 was considered statistically significant. Analyses were performed using Stata version 18 (StataCorp LLC, College Station, TX, USA).

Results

Among the 125 patients who attended the clinic over 20 consecutive months, 107 had a history of falls in the previous 6 months. Twelve patients were lost to follow-up, and two died due to cancer and acute-on-top chronic subdural hematoma. Eighteen patients did not complete the 6-month follow-up schedule. Consequently, 93 patients were included in the analysis for primary and secondary outcomes. Table 1 shows the baseline characteristics

Table 1 Demographic, clinical, and biochemical characteristics of patients attending the geriatric fall clinic.

	N **= 125**
Characteristics	**Number (%)**
Age, mean (SD)	76.30 (8.5)
Sex	
Female	90 (72)
Male	35 (28)
BMI, mean (SD)	23.4 (4.0)
BMI categories	*N* = 123
Underweight (<18)	7 (5.7)
Normal (18–24.99)	74 (60.2)
Overweight (25–30)	35 (28.5)
Obesity (>30)	7 (5.7)
Living places	
Home	117 (93.6)
Townhouse	1 (0.8)
Commercial building	4 (3.2)
Nursing home	4 (3.2)
Referred by [No (%)]	
Family physicians	24 (19.2)
Neurologists	8 (6.4)
Neurosurgeons	3 (2.4)
Orthopedic surgeons	61 (48.8)
General medicine	13 (10.4)
Rehabilitation physicians	3 (2.4)
Walk-in	14 (11.2)
Number of comorbidities, mean (SD)	2.95 (1.4)
Medical problems	
Hypertension	91 (72.8)
Diabetes mellitus	44 (35.2)
Chronic kidney disease	16 (12.8)
Cerebrovascular disease	32 (25.6)
Dementia	26 (20.8)
Parkinson	11 (8.8)
Osteoporosis	78 (62.4)
Degenerative joints	62 (49.6)
Fall risks (%)	
High risk	98 (78.4)
Moderate risk	20 (16.0)
Low risk	8 (6.4)
Serum 25(OH) vitamin D (ng/mL)	*N* = 83
[mean, (SD)]	27.77 (9.1)
<20 ng/mL [No, (%)]	6 (7.2)
20–30 ng/mL [No, (%)]	49 (59.0)
>30 ng/mL [No, (%)]	28 (33.7)
BMD categories, n (%)	*N* = 58
Normal (>−1)	2 (3.5)
Osteopenia (−2.5 to −1)	23 (39.7)
Osteoporosis (<−2.5)	33 (56.9)

of all 125 patients. Not all participants were recruited through STEADI; 19.2% were referred by family physicians following STEADI assessment, 11.2% were walk-in patients who also underwent STEADI screening, and the remainder were referred from other departments based on clinical judgment or documented fall history.

Figure 1 illustrates the risk factors contributing to falls. Extrinsic factors were the most common. Polypharmacy was the second most prevalent risk factor (68%), with sedatives and antipsychotic medications being the most frequently implicated fall-related drugs. Among intrinsic factors, osteoporosis was the most frequently identified (62.4%).

Table 2 presents the types and frequencies of multifactorial interventions provided. Most patients (80.65%) received between three and five different interventions. The three most implemented interventions were home-based exercise programs (79.56%), osteoporosis or osteopenia treatment (74.19%), and counseling on fall prevention (66.67%). Thirty-one patients (33.33%) were fast-tracked to specialist care; of these, 24 patients (25.81%) were referred to ophthalmologists, with a mean waiting time of 90 days. Five patients underwent a fall clinic neurologist evaluation for the management of Parkinson's disease. One patient was diagnosed with cervical myelopathy and underwent neurosurgical intervention. Another patient with severe knee osteoarthritis received an intra-articular hyaluronic acid (Hyagan®) injection under orthopedic care. Twenty-two patients (23.6%) received home visits from a multidisciplinary home healthcare team.

Table 3 presents a comparison of primary and secondary outcomes from baseline to the 6-month follow-up. The number of falls per patient significantly decreased 6 months after clinic attendance (2.10 ± 3.49 vs. 0.55 ± 2.22, $P < .001$). The proportion of fallers also significantly declined (82.79% vs. 21.50%, $P < .001$). Additionally, the number of patients who sustained serious injuries due to falls was significantly lower in the 6 months following clinic attendance (51.60% vs. 5.38%, $P < .001$). Figure 2A and B illustrate improvements in the number of falls and serious fall-related injuries from baseline to the 6-month follow-up.

Mobility and balance improved significantly in 6 months. The proportion of patients completing the TUG test in under 12 s increased from 22.6% to 41.9% ($P = .0035$). Those capable of performing more than 10 repetitions in the 30-s chair stand test rose from 12.5% to 33.3% ($P = .0039$). Tandem stance ability (≥10 s) improved from 15.4% to 32.1% ($P = .0016$), while grip strength exceeding 28 kg in men or 18 kg in women increased from 27.3% to 39.4% ($P = .021$).

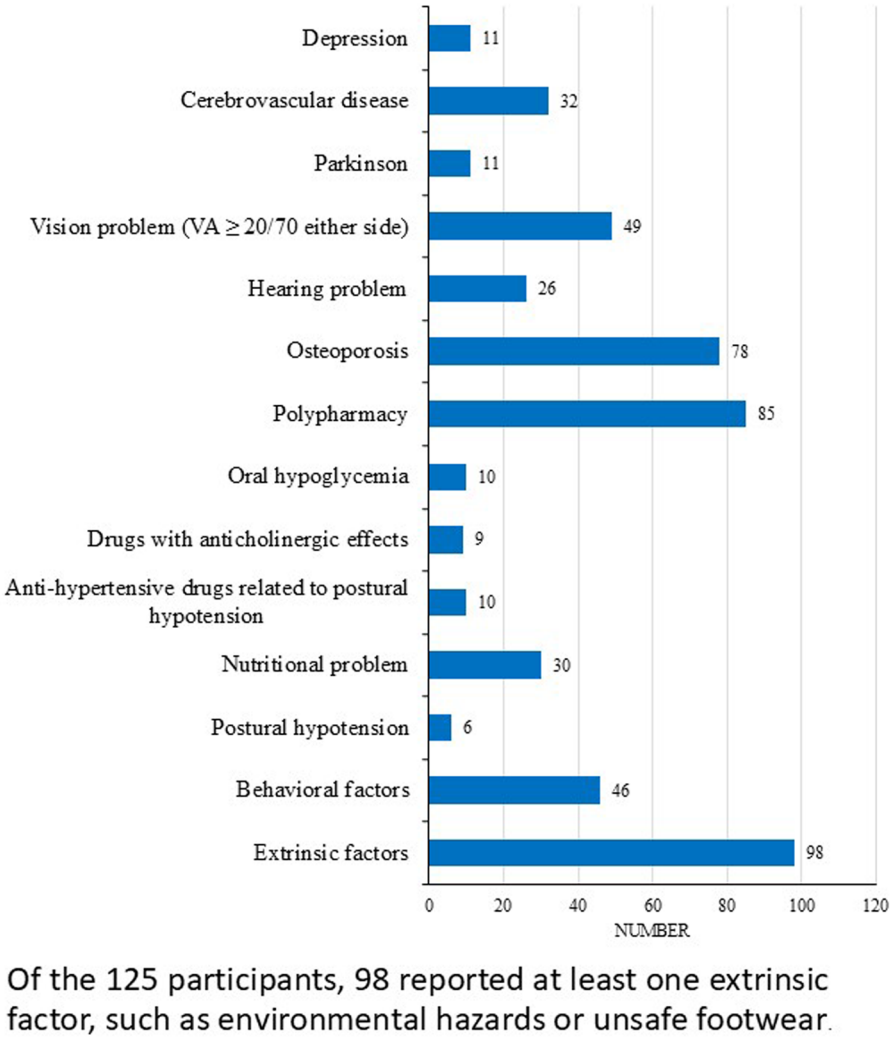


Figure 1 Contributing factors identified during the fall risk assessment.

Table 2 Description of types and frequencies of multifactorial interventions received by patients attending the geriatric fall clinic.

	N = 93
Interventions	**Frequency (%)**
Medication adjustment (deprescribe fall-related drugs, drug compliance improvement)	12 (12.9)
Management of intrinsic causes	
Osteoporosis or osteopenia treatment	69 (74.1)
Vitamin D supplement	46 (49.5)
Sarcopenia	45 (48.4)
Dementia	22 (23.7)
Fast-tracked specialist referral	
Ophthalmologists	24 (25.8)
Neurosurgeons/orthopedic surgeons	2 (2.2)
Neurologist	5 (5.4)
Home-based exercise program	
Modified Otago program	74 (79.6)
Patients and caregivers counseling	
Counseling patients and caregivers about proper gait aid use, appropriate shoes, or fall precautions	62 (66.7)
Education of home hazards (video or brochure information)	50 (53.8)
Home visit for environmental modifications	
Home environmental modification, exercise program, proper gait aids use	22 (23.7)
Number of interventions	
None	3 (3.2)
1–2	13 (14.0)
3–5	75 (80.7)
6	2 (2.2)

Table 4 presents the univariate and multivariate analyses of predictors of new falls within 6 months. Sedative or antipsychotic use at baseline was associated with higher fall risk (OR 5.39; 95% CI: 1.74–16.64; $P = .003$), as was residence in commercial multi-story buildings with upstairs living quarters (OR 15.91; 95% CI: 1.41–179.23; $P = .025$).

Regarding patient satisfaction, over 80% of patients and caregivers reported satisfaction with the assessment, the information provided, and the care recommendations. While some noted that visit duration was lengthy, nearly all rated the clinic experience positively. Figure 3 shows the satisfaction details.

Discussion

Statement of principal findings

This 6-month pre-post intervention study was conducted in the unique setting of a multidisciplinary geriatric fall clinic embedded within a primary care setting. We observed a significant reduction in fall rates and serious fall-related injuries, as well as improvements in mobility and functional performance.

Interpretation within the context of wider literature

Previous studies [13, 14, 16] have shown that fall clinics can reduce fall incidence and improve function; however, most were conducted in specialized or rehabilitation settings. A recent Australian study [15] emphasized the role of multidisciplinary fall and fracture clinics in addressing both osteoporosis and fall-risk factors through a coordinated care model. Our clinic, with its

Table 3 Patients' outcomes at baseline and 6 months after geriatric fall clinic attendance.

	Baseline	**6 months after clinic attendance**	***P*-value**
Falls **(%)**	*N* = 93	*N* = 93	
Number of falls, mean (SD)	2.10 (3.49)	0.55 (2.22)	<0.001
Number of fallers	77 (82.79)	20 (21.50)	<0.001
Number of falls with severe injuries	48 (51.6)	5 (5.38)	<0.001
Mobility (%)			
TUG test (%)	*N* = 62	*N* = 62	0.0035
<12 s	14 (22.58)	26 (41.93)	
12–20 s	16 (25.81)	13 (20.97)	
>20 s	32 (51.61)	23 (37.10)	
30 s chair stands (%)	*N* = 48	*N* = 48	0.0039
≤10 times	42 (87.5)	32 (66.67)	
>10 times	8 (12.5)	16 (33.33)	
4-stage balance test (%)	*N* = 78	*N* = 78	
One-leg stand ≥ 10 s	2 (2.53)	7 (8.86)	0.059
Perform tandem ≥ 10 s	12 (15.38)	25 (32.05)	0.0016
Perform tandem < 10 s	66 (84.62)	53 (67.95)	
Grip strength (%)	*N* = 66	*N* = 66	
≤28 kg in men, ≤18 kg in women	48 (72.73)	40 (60.61)	0.021
>28 kg in men, >18 kg in women	18 (27.27)	26 (39.39)	
Gait speed (%)	*N* = 47	*N* = 47	
≥1 m/s	7 (14.89)	9 (19.15)	0.527
<1 m/s	40 (85.11)	38 (80.85)	

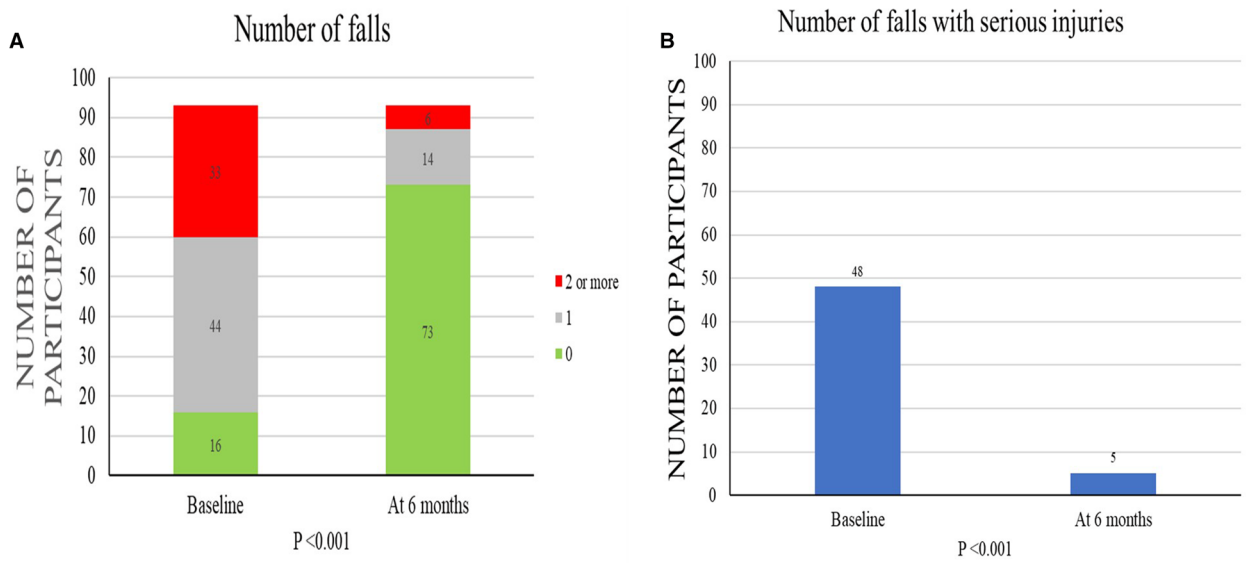


Figure 2 Level of improvement in the number of fallers and fallers with serious injuries from baseline to the 6-month follow-up.

primary care environment, offered similar multifactorial interventions ranging from rehabilitation to prompt treatment of osteoporosis and dementia, medication adjustment, and patient/caregiver counseling. These services are integrated with expedited referrals to specialists for vision impairment, Parkinson's disease, and musculoskeletal conditions, thereby facilitating continuity of care. Compared to a UK cluster-randomized trial [25] of multifactorial interventions in primary care, which showed only short-term benefits from exercise over a multidisciplinary approach. Similarly, a pragmatic trial [26] in Malaysia found no significant reduction in falls and attributed the limited impact to barriers such as transportation, appointment adherence, and patient/provider engagement.

Although our observational study lacked a control group, it enabled real-world evaluation in a fall-risk population. Following the intervention, we observed an 89.6% reduction in serious injuries and a 74% decrease in fall incidence. The greater proportional reduction in serious fall-related injuries relative to the number of falls may reflect the effectiveness of our targeted interventions, such as osteoporosis management, home-based exercise programs, and home safety education, as these likely mitigated injury severity of those who continued to fall. These outcomes align with World guidelines [27] advocating personalized, multidomain strategies for fall prevention in high-risk older adults.

Multivariate analysis further highlighted the critical role of targeted deprescribing by demonstrating that continued use of sedative and antipsychotic medications was independently associated with recurrent falls. In our clinic, medication review and deprescribing were part of the core intervention; however, only 11.8% of participants had medication adjustments recorded. This limited uptake may reflect barriers such as patient reluctance, provider hesitation, or the complexity of tapering regimens for long-term users. While overall intervention appeared effective in reducing falls and injuries, these findings highlight an important area for improvement. Future programs should consider structured deprescribing protocols, guided by validated tools, together with provider training and shared decision-making strategies to enhance deprescribing efficacy. Additionally, living in multistory commercial buildings was independently associated with recurrent falls. Although only 3% of participants lived in this environment, the association remained significant. These buildings may pose unique environmental risks of falls among geriatric patients due to frequent stair use and limited indoor mobility. However, our sample size limits generalizability. Nevertheless, this finding highlights the need to consider housing contexts in fall risk assessment and may warrant further investigation.

Strengths and limitations

Several strengths support our findings. One is that the study was conducted in a real-world setting and included a high-risk older population. Notably, locating the fall clinic within a primary care facility facilitated seamless transitions between outpatient, specialty, and home-based services. Furthermore, a strong understanding of older adults' attitudes supported patient engagement and high satisfaction.

However, several limitations should be noted. First, the absence of a control group and reliance on pre–post comparisons limit causal inference. Second, fall events were primarily self-reported, introducing potential recall and social desirability bias. Nonetheless, serious falls were corroborated with medical records, and follow-ups were conducted within 30–60 days to minimize recall errors. Third, the physical limitations of some patients resulted in incomplete physical performance assessments (e.g. gait speed, chair stand); this was particularly the case for the highest-risk individuals. Finally, while polypharmacy was a prevalent risk factor, medication adjustments were made in only 11.8% of patients. As noted in other studies [28, 29], adherence to deprescribing recommendations remains a challenge, particularly when multiple prescribers are involved.

Implications for policy, practice, and research

The reduction in falls, injuries, and mobility limitations supports integrating structured fall-prevention clinics into primary care as a scalable, patient-centered model. Our data suggest that these

Table 4 Univariate and multivariate analyses of predictors for new falls following geriatric fall clinic attendance.

Factors	Univariate analysis		Multivariate analysis	
	Crude OR (95%CI)	*P*-value	Adjusted OR (95%CI)	*P*-value
Female	1			
Male	2.04 (0.72,5.77)	0.180		
Age	0.99 (0.94,1.05)	0.797		
BMI	1.05 (0.93,1.19)	0.399		
Type of residence				
Home	1			
Townhouse	1 (empty)			
Commercial building	12 (1.17,122.69)	0.036	15.91 (1.41,179.23)	0.025
Nursing home	1 (empty)			
Fall risks				
High risk	0.53 (0.12,2.47)	0.423		
Moderate risk	1 (empty)			
Low risk	1			
Intrinsic factors				
Vision problem (VA ≥20/70 either side)				
No	1			
Yes	2.48 (0.90,6.82)	0.079		
Hearing problem				
No	1			
Yes	0.43 (0.09,2.06)	0.291		
Nutritional problem				
No	1			
Yes	1.54 (0.47,4.99)	0.473		
Cerebrovascular disease				
No	1.31 (0.39,4.43)	0.665		
Yes	1			
Dementia				
No	1			
Yes	2.08 (0.71,6.13)	0.183		
Parkinson				
No	1			
Yes	3.94 (0.52,29.95)	0.185		
Osteoporosis				
No	1.57 (0.58,4.29)	0.378		
Yes	1			
Degenerative joints				
No	1.26 (0.47,3.39)	0.653		
Yes	1			
Polypharmacy				
No	1			
Yes	1.45 (0.50,4.22)	0.493		
Sedatives or antipsychotics				
No	1			
Yes	4.21 (1.47,12.07)	0.007	5.39 (1.74,16.64)	0.003
Oral hypoglycemia				
No	1			
Yes	1.05 (0.20,5.49)	0.956		
Anti-hypertensive drugs related to postural hypotension				
No	1			
Yes	0.91 (0.10,8.61)	0.933		
Behavioral factors				
No	1			
Yes	1.14 (0.41,3.13)	0.805		
Extrinsic factors				
No	1			
Yes	0.46 (0.15,1.43)	0.180		

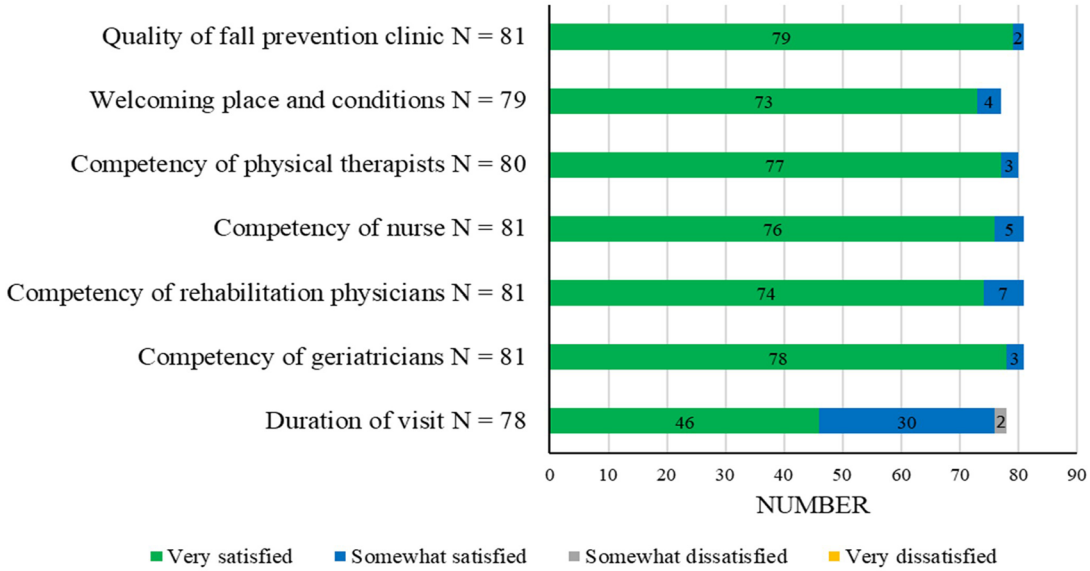


Figure 3 Satisfaction with the geriatric fall clinic reported after clinic attendance.

programs may reduce healthcare costs associated with fall-related injuries and hospitalizations. However, further research should explore provider attitudes, prescribing behaviors, and barriers to implementing deprescribing. Replication in diverse primary care settings is also warranted to evaluate the scalability and generalizability of this clinical strategy.

Conclusions

The findings of this study demonstrated that, when operating as an integrated, multidisciplinary model within a primary care setting, a geriatric fall clinic was associated with significant reductions in falls and serious fall-related injuries among older adults. Participation in the clinic was also linked to meaningful improvements in mobility and functional performance. The findings also identified deprescribing sedatives and antipsychotic medications and providing targeted education on home safety as key strategies for further management of fall risks in this population.

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Author contributions

C.B., T.V., W.W., K.S.1, P.P., and S.N. contributed to the study's conceptualization, investigation, and project administration. C.B., T.V., P.W., K.S.2, and S.Y. were responsible for the methodology, supervision, and resource acquisition. All authors read and approved the final manuscript. The corresponding author confirms that all listed authors meet the authorship criteria and that no potential authors have been omitted.

Supplementary material

Supplementary material is available at *IJQHC* online.

Conflicts of interest

There is no conflict of interest to declare.

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Data availability

The datasets used or analyzed during this study are available from the corresponding author on reasonable request.

Ethics statement

The study was approved by the Human Research Ethics Committee of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Thailand (approval no. MURA 2023/113). Written informed consent was obtained from all participants or their legally authorized representatives.

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