Saunders et al. BMC Geriatrics (2026) 26:182
https://doi.org/10.1186/s12877-025-06724-9

BMC Geriatrics

RESEARCH Open Access

The INITIATE (Initial Test for Fall Risk Assessment in the Elderly) prospective cohort study: baseline results

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Abstract

Background Fall prevention recommendations include mobility or balance testing to identify older adults with high fall risk who require further intervention. However, there is no consensus on the best tests or optimal cut-off values. The Initial Test for Fall RIsk Assessment in The Elderly (INITIATE) study was designed to determine the optimal screening test(s) for predicting falls among community-dwelling older adults. Here we describe the study protocol, sample characteristics, and baseline differences between participants with and without a history of falling.

Methods We undertook a 1-year prospective cohort study of community-dwelling older adults (≥ 65 years) able to walk 10 m without assistance at baseline and living in Ontario, Canada. Participants underwent a 2-hour baseline visit where 7 validated balance and mobility tests (Timed up and go (TUG) usual pace, TUG fast pace, TUG with a cognitive dual task, Brief Balance Evaluation Systems Test (BESTest), 5 times sit-to-stand (5TSTS), single leg stance, gait speed) were administered. Falls were tracked for 12 months using monthly diaries and follow-up calls for context. Participants received quarterly calls to monitor general wellbeing, healthcare utilization, and changes to mobility. Descriptive statistics were calculated and differences by 12-month fall history were tested using t-tests, chi square tests, and Wilcox Rank Sum tests as appropriate.

Results From 3211 contacted older adults, 514 (19%) consented. The mean age was 76.4 years (SD 6.7), 64% were female, 68% had a postsecondary degree/diploma, and 231(45%) reported a fall in the last 12 months. Means(SD) for the performance-based tests were as follows: TUG = 11.8s(4.0), TUG fast pace = 9.2s(3.4), TUG cog = 14.2s(5.9), Brief BESTest = 15.9 score(5.3), 5TSTS = 12.5s(4.3), single leg stance = 14.1s(16.3), gait speed = 1.14 m/s(0.28). Comparisons between baseline fallers and non-fallers showed no differences in age, sex, income, or education($p > 0.05$) but did show differences in all 7 tests($p < 0.05$).

Conclusions Participants are representative of community-dwelling older adults with fall risk. Balance and mobility test differences between fallers and non-fallers support the need for prospective comparisons of their predictive validity. Follow-up results, expected in late 2025, will help inform future updates to fall risk assessment and prevention guidelines.

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Keywords Falls, Aging, Community dwelling, TUG, Mobility, Physical function, Balance

Background

Falls are the leading cause of injury-related hospitalization among older adults, resulting in substantial disability and early mortality [1–3]. Non-injurious falls have shown debilitating effects including fear of falling, reduced physical activity, and depression [4]. Due to the aging of the global population, the incidence of falls is expected to continue to rise, underscoring the importance of early fall risk detection for mitigating the impacts of falls [1].

There is an abundance of evidence demonstrating that falls can be prevented by as much as 20 to 40% [5–7], by identifying modifiable fall risk factors and providing targeted interventions. Risk of falling is complex and multifactorial because of its intricate etiology that can involve interactions between many health conditions and an accumulation of age-related impairments in multiple systems [8]. While studies have identified hundreds of fall risk factors, previous falls and balance and mobility impairments have consistently emerged as the strongest independent risk factors [9, 10].

Because poor balance is a leading risk factor for falls, balance and mobility testing are consistently recommended in clinical practice guidelines (CPGs) as part of fall risk assessment and prevention [2, 11–14]. Common to CPGs are multiple self-report screening processes designed to determine if further assessment is warranted (e.g., history of falls and injury). In cases where the fall risk is unclear, a clinical assessment for balance or mobility impairment is recommended. Those whose balance or mobility performance is below a pre-specified cut-off value should be referred for tailored interventions.

However, differing guidelines recommend different tests, with little clarity on the specific test and/or cut-off values to use. For instance, the World Guidelines for Falls Prevention algorithm for fall risk stratification [2] recommend the gait speed test or the Timed Up and Go (TUG) test [15], using cutoffs of ≤ 0.8 m/s and >10 seconds [16], respectively, to identify those at low or intermediate risk of future falls. In contrast, in the US Centre for Disease Control's (CDC) fall prevention algorithm, STEADI (Stopping Elderly Accidents, Deaths, and Injuries) [17], the TUG is recommended with a cutoff of ≥ 12 s to predict risk of future falls, whereas the UK's NICE guidelines recommend any "assessment of balance and gait" [11].

The lack of consensus on specific tests and clinically meaningful cut-off values likely reflects both the paucity of prospective studies examining the predictive validity of the screening tests and the absence of a single test that comprehensively captures all aspects of balance [18]. Systematic reviews have found that most tests report insufficient accuracy for predicting falls, have long administration times, and have not been validated in prospective studies [19, 20]. These shortcomings limit the uptake of CPGs for fall prevention and highlight the need to establish the predictive validity of clinically feasible short balance and mobility screening tools to inform evidence-based recommendations for fall risk screening. To address these gaps, we designed the Initial Test for Fall RIsk Assessment in The Elderly (INITIATE) study to estimate the discriminant ability and optimal cut-off values of seven short mobility and balance screening tests for predicting falls in a community-dwelling sample of older adults. The primary aim of this report is to characterize the baseline attributes of the cohort and examine the differences in participant characteristics and mobility test performance between individuals with and without a history of falls in the preceding 12 months.

Methods

Study design

A prospective cohort study conducted in a sample of $n = 514$ community dwelling older adults (aged ≥ 65 years) from Ontario, Canada. Participants underwent a baseline assessment and were followed for 12 months via monthly fall diary postcards and phone interviews every 3 months. The study began in March 2020 with 17 participants but due to the COVID-19 pandemic recruitment was paused. Recruitment resumed in March 2022 until September 2023 with data collection completed in October 2024. The 12-month follow-ups for the first 17 participants were completed remotely as scheduled in 2021. The study received ethical approval from the Hamilton Integrated Research Ethics Board (#7380).

Study sample and recruitment of participants

Eligibility criteria were 1) ≥ 65 years; 2) community dwelling; 3) able to walk 10-metres without physical assistance from another person (gait aids were allowed); 4) able to attend the data collection site at McMaster University in Hamilton, Ontario; 5) able to communicate in English, and 6) able to provide informed consent. Community-dwelling was defined as not living in institutions that provide skilled care (i.e., hospitals, nursing homes, or assisted living facilities).

We used a multi-pronged strategy to recruit participants. First, we randomly dialed publicly listed residential phone numbers provided by ASDE Solutions, a commercial sampling company [21]. Using 2016 Census data, we identified postal codes within the Hamilton area with the greatest proportion of adults aged 65 and older. These postal codes were submitted to ASDE Solutions, which generated a list of 10,000 phone numbers evenly distributed across the selected areas. For additional details on this method, see Beauchamp et al., [22]. Second, we recruited from a list of randomly sampled participants from previous studies led by the principal investigator (MKB) who had consented to be contacted for future studies. Finally, due to recruitment challenges related to the COVID-19 pandemic, we placed targeted newspaper and social media advertisements beginning in June 2023, midway through the study. These advertisements focused on demographic groups that were underrepresented in the sample, specifically men and individuals not born in Canada.

Study procedures

Participants completed a baseline assessment via phone or online surveys and a two-hour in-person physical assessment (details below). Prior to data collection, all assessors underwent 3 training sessions, supervised by the principal investigator who is a physiotherapist experienced with all tests (MKB), to ensure assessors followed Standard Operating Procedures. For 12-months after baseline, participants reported any falls each month via fall diary postcards, and every 3 months they took part in a phone interview, in line with the gold-standard PROFANE guidelines [23]. See Table S1 for the schedule of data collection and assessments.

Study measures

Fall outcomes

Our primary outcome is the number of falls participants experienced over 12 months of follow-up. Falls were defined as "an unexpected event in which the individual comes to rest on the ground, floor, or lower level" [23]. Participants recorded their falls in a fall diary on prepaid postcards that were mailed back to the research team monthly. If postcards were not received, the research team followed up with participants by phone. When falls were reported, the study team contacted participants to verify that the reported fall(s) met the definition, capture the circumstances surrounding the fall(s), and record any visits to a healthcare provider as a result of the fall(s). These phone calls also recorded injurious falls, which were classified based on symptoms as serious (fracture, requiring ER visit, or inpatient treatment), moderate (requiring healthcare examination), or minor (bruising/abrasion or reduction in physical function for at least 3 days with no health care visit) [24]. In addition to the monthly diaries, participants engaged in a phone interview every three months to verify no falls went unreported on the postcards, complete global rating of change scales for general health and mobility, and report any healthcare utilization related to a fall (i.e., if they had a fall and had been receiving follow-up care).

Performance based measures

Participants were asked to complete 7 balance and mobility measures wearing either flat shoes or, when wearing inappropriate footwear (i.e., boots, high heels), in bare feet. For measures that required a chair, we used a standard chair with armrests and a seat height of 17.5 inches. Participants were permitted to use a gait aid for the walking tests if needed. No practice trials were given. The measures were administered in a random order to prevent ordering effects. We initially selected 6 tests based on the following eligibility criteria to identify the most clinically relevant tests for fall risk screening: 1) ≤ 10 min to administer (to ensure feasibility), and 2) at least one of the following: (i) recommended by a fall prevention CPG; or (ii) preliminary evidence supporting the measure's predictive validity for falls (≥ 1 fall) from a prospective study of older adults. We added the Gait Speed test on June 7, 2023 when the World Falls Guidelines were published advocating for the use of gait speed as part mobility screening. This test was initially excluded based on literature showing poor predictive ability for falls among community dwelling older adults [25, 26]. The final included measures are listed below; for full psychometric properties of each measure see Table S2.

1) TUG [15] usual pace: Participants start sitting in a chair and when the assessor says "go" they stand up, walk 3 m at their normal pace, turn 180 degrees, return to the chair and sit. The time starts when the assessor says go and stops when the participant is sitting back down. A shorter time to complete this task indicates better mobility. The TUG is commonly used and is among the most widely cited in clinical practice guidelines [17, 27, 28].
2) TUG fast pace: Participants complete the TUG, but rather than walk at their normal pace, participants are asked to walk as quickly as they feel safe and comfortable without running. A shorter time to complete this task indicates better mobility.
3) TUG with cognitive dual task (TUG cog) [29]: Participants start sitting and are asked to count backwards by 3 starting at 90. When they reach 84 the assessor says "go" and participants complete a TUG at their normal walking pace, all while continuing to count backwards. The assessor starts the timer when they say "go" and stops when participants sit back down. Shorter times indicate better performance. The test examines the cost of adding a cognitive demand onto a motor demand, since cognitive deficits are clearly associated with increased fall risk [30, 31].
4) Brief Balance Evaluation Systems Test (Brief BESTest) [32]: The test assesses 6 components of the

Systems Framework for Postural Control, with three components assessing both right and left sides [32]. The test takes approximately 10 min to complete, each item is scored 0 to 3 to a maximum score of 24, with higher scores indicating better balance. The 6 items assess biomechanical constraints (lateral leg lift), stability limits/verticality (reach forward), anticipatory postural adjustment (single leg stance), reactive postural response (compensatory step), sensory orientation (standing on foam with eyes closed), and stability in gait (timed up and go). The advantage of the Brief BESTest is its assessment of reactive postural control and verticality, as these are not typically included in balance assessments [33].

5) 5 Times Sit to Stand test (5TSTS): Participants start seated with their feet flat on the floor, then stand up and sit down five times as quickly as they can. The assessor starts timing when they say "go" and stops timing on the final stand. Participants had the option to use the armrests or not and their selection was recorded. Shorter times indicate better balance and strength [34, 35]. The 5TSTS is the most commonly used version of the chair rise test [36], and, in protocols where use of arms was not permitted, it demonstrates good post-test probability for predicting 2 or more falls [9].
6) Single Leg Stance Test (SLS) [37]: Participants are asked to stand upright with their hands on their hips and lift one foot off the floor by bending the knee backwards. They are instructed to hold this position for as long as possible, to a maximum of 60s. Longer standing time indicates better static balance. Two trials are conducted on each leg, and participants were allowed to choose their preferred starting leg. This test is among the most commonly used balance test by clinicians [38, 39].
7) Gait Speed Test: Participants start standing and when instructed begin walking at their normal speed for a total of 7 m (2 m acceleration area, 3 m measurement area, and 2 m deceleration area). Assessors begin timing on the first footfall after the 2-metre acceleration zone and stop timing at the first footfall after the 3-metre walking area. Gait speed has shown excellent predictive validity for declining general health, however mixed results for predicting falls (AUCs = 0.57 to 0.64) [25, 26]. This test is currently recommended as part screening for falls risk in the World Falls Guidelines [2].

Descriptive and secondary variables

Measures were selected to capture key biological, behavioural, socioeconomic, and environmental contributors to fall risk. Surveys asked about demographic background (e.g., age, sex, gender, race), socioeconomic status (e.g., income, education, residential dwelling), psychosocial wellbeing (e.g., social support, mood disorders, general wellbeing, fall self-efficacy), physical wellbeing (e.g., self-report function, mobility, hearing, vision), and environmental considerations (e.g., walkability, neighborhood characteristics). Physical measures included hearing audiometry, vision acuity, grip strength, height, weight, blood pressure, heart rate, foot sensation, and cognition. See Table S1 for schedule of data collection for all measures, Table S3 for psychometric properties, and supplementary file 1 for the physical assessment protocol. On July 13, 2023 due to changes in recognizing different gender statuses, we added an additional question asking more details about gender.

Statistical analysis

We report baseline descriptive statistics: means and standard deviations (SDs) for continuous parametric data, medians and interquartile ranges for non-parametric data, and frequencies and proportions for categorical data. To test for baseline differences between those who did and did not report falling in the previous 12-months we used t-tests, chi square tests, and Wilcoxon rank sum tests as appropriate. All analyses were undertaken using R (version 2024.04.2 + 764) with the level of statistical significance (2-tailed) set at 0.05. Sample size was calculated to meet the overall objective of INITIATE.

Results

Recruitment and sample

Sampling sources and study flow are shown in Fig. 1. Of 2,785 individuals contacted by phone, 164 consented to participate. Another 426 individuals were recruited via advertisements or referrals from friends and family. Five hundred and fourteen participants consented and completed baseline assessments. On descriptive examination, those who did not complete the study appeared older, with lower education and poorer health status, and showed a higher proportion of male participants.

Baseline characteristics

Sociodemographic, health factors, and physical measures are reported in Table 1. The mean age of the sample was 76.4 years (± 6.7), more participants were female (*n*=328, 64%), 68% (*n* = 349) had completed post-secondary education, and most were born in Canada (*n*= 373, 76%). In terms of general health status, participants rated themselves as having excellent/very good/good general health (*n*=436, 86%) and mental health (*n* = 460, 89%). Almost all participants were taking a medication (*n*= 465, 91%), with a median of 3 (IQR=4) per day. In terms of mobility, 25% (*n*=126) used a gait aid, 45% (*n*=231) had fallen

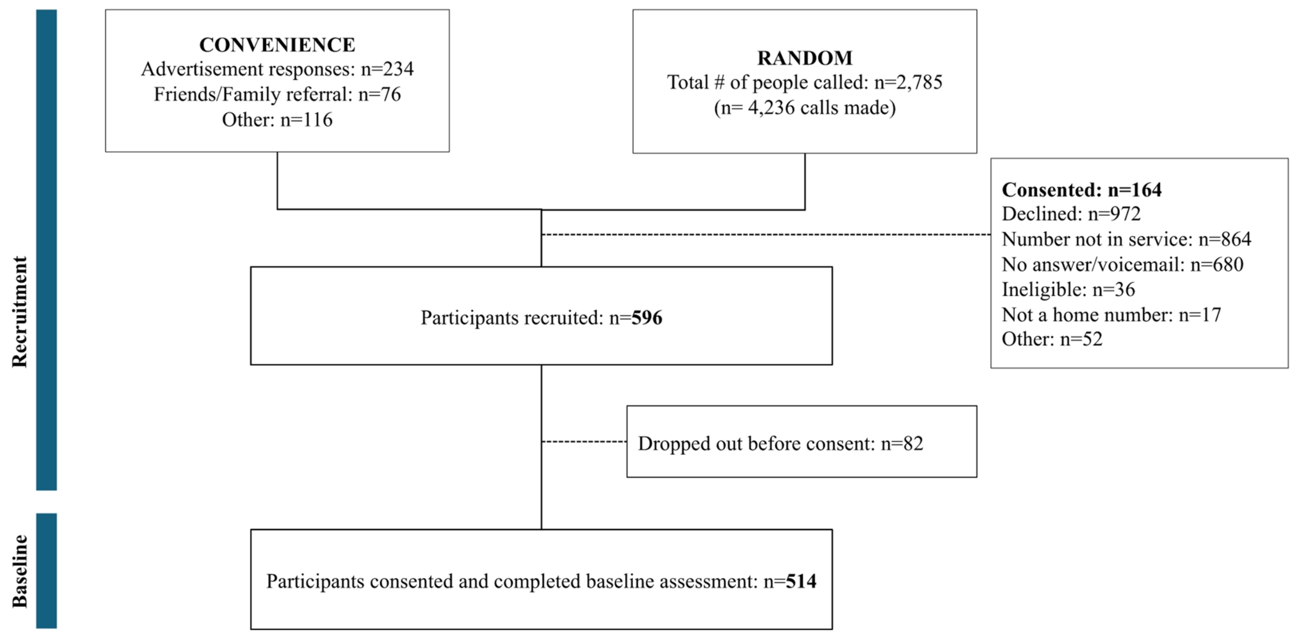

Fig. 1 Participant sampling and study flow

in the previous 12 months, and 100% (n=514) answered 'yes' to at least one of the World Falls' Guidelines screening questions [2]. In comparing the sociodemographic characteristics between the sample recruited via random number lists (n=124) and via community advertisements (n=390), the random proportion of the sample was older (mean difference = 1.80 years, $p < 0.01$) and had less education ($p < 0.001$) than the convenience sample. Other characteristics, including sex, income, and number of falls, were not significantly different ($p > 0.05$).

The descriptive statistics, sample sizes, and missing data for the balance and mobility tests are reported in Table 2. Two participants did not complete the entire assessment because they chose to leave prior to completion. Three participants were unable to understand the TUG cog test instructions and three refused to complete it. One participant chose not to complete the 5TSTS test. Researchers ended the session early for one participant due to a high blood pressure reading that was contra-indicated for the tests. One adverse event occurred where a participant experienced a fall during the Brief BESTest reactive postural response item. No injuries were reported and the participant did not seek medical attention.

For the entire sample, 231 participants had a fall in the previous 12 months and were classified as fallers, while 283 did not have a fall (non-fallers). Few baseline sociodemographic and participant characteristics were significantly different between these two groups. Age, sex, education levels, and income were all similar between fallers and non-fallers ($p > 0.05$; Table 3). For self-report measures of mobility, there was a significant difference between fallers and non-fallers with respect to using a gait aid ($p < 0.01$) and among those who felt unsteady with standing or walking ($p < 0.01$). All performance-based mobility and balance tests were significantly different between fallers and non-fallers ($p < 0.05$), however the magnitude of the differences were small and only TUG usual pace, single leg stance, and gait speed met MCID thresholds (Table 4). For the 5TSTS test, 47% of participants ($n = 239$) used the armrests, whereas 53% ($n = 267$) did not. There was a significantly higher proportion of fallers in those who used armrests compared with those who did not (fallers with armrests: $n = 124$ vs. fallers no armrests: $n = 102$, $p < 0.001$).

Discussion

The baseline results of this prospective cohort study indicate we are well positioned to conduct a comprehensive and rigorous examination of the predictive validity of different balance and mobility screening tests in community dwelling older adults. Notably, the overall sample closely resembled national cohorts, supporting the generalizability of our findings [26]. Further, our sample closely reflects community dwelling older adults targeted by current fall prevention CPGs. Although most sociodemographic characteristics did not differ between fallers and non-fallers, baseline differences in balance and mobility performance highlight the importance of evaluating these measures prospectively.

Given the importance of generalizability in predictive validity research, we examined whether recruitment method influenced sample characteristics. Differences between randomly sampled and convenience groups were small, with only age and education reaching statistical

Table 1 Baseline descriptive statistics: sociodemographic, health-related, falls, and physical measures

Demographic	
Age, mean (SD)	76.4 (6.7)
65–74, *n* (%)	218 (42)
75–84, *n* (%)	236 (46)
85+, *n* (%)	60 (12)
Female sex, *n* (%)	328 (64)
BMI, mean (SD)	28.1 (5.6)
< 25 kg/m^2, *n* (%)	156 (31)
$\geq$ 25 kg/m^2, *n* (%)	354 (69)
Not reported, *n* (%)	4 (< 1)
Education, *n* (%)	
< Secondary school	31 (6)
Secondary school graduation but no post-secondary education	51 (10)
Some post-secondary education	83 (16)
Post-secondary degree/diploma	349 (68)
Income, *n* (%)	
<$20,000	13 (3)
$20,000 or more but <$50,000	115 (22)
$50,000 or more but < $100,000	210 (41)
$100,000 or more, but <$150,000	94 (18)
$150,000 or more	58 (11)
Not reported	24 (5)
Marital status, *n* (%)	
Single	34 (7)
Married/living with a partner in common-law relationship	282 (55)
Widowed	114 (22)
Divorced or separated	62 (12)
Not reported	22 (4)
Born in Canada, *n* (%)	373 (76)
Not reported	22 (4)
Health Related	
Self-reported health status, *n* (%)	
Excellent/very good/good	436 (86)
Fair/poor	45 (9)
Not reported	23 (5)
Self-reported mental health status, *n* (%)	
Excellent/very good/good	460 (89)
Fair/poor	30 (6)
Not reported	24 (5)
Mean number of diagnosed health conditions, mean (SD)	2.4 (1.88)
Cataracts, *n* (%)	302 (59)
Osteoarthritis, *n* (%)	230 (45)
Hypertension, *n* (%)	217 (42)
Cancer, *n* (%)	114 (22)
Number of medications taken per day, median (IQR)	3 (4)
Use a walking aid, *n* (%)	126 (25)
Falls	
Yes to at least 1 fall screening question, *n* (%)	514 (100)
Fell $\geq$ 1 times previous 12 months, *n* (%)	231 (45)
Unsteady w standing/walking, *n* (%)	270 (53)
Worried about falling, *n* (%)	223 (43)
Total number of falls previous 12 months, *n*	461

Table 1 (continued)

Physical Measures	
Blood pressures (systolic mmhg), mean (SD)	135.8 (19.8)
Blood pressure (diastolic mmhg), mean (SD)	74.7 (10.3)
Not reported, *n* (%)	6 (1)
Grip strength (kg), mean (SD)	27.5 (9.2)
Not reported, *n* (%)	9 (2)
Vision acuity (ETDRS Acuity Log Score), mean (SD)	0.1 (0.1)

Table 2 Baseline descriptive statistics: balance and mobility test results

Measure	*N*	Missing (*N*)	Mean (SD)	Median (IQR)	Recommended cutoffs for identifying fall risk
TUG usual pace (seconds)	514	0	11.8 (4.0)	10.6 (3.9)	10–13.5.5 seconds [2, 17, 40]
TUG fast pace (seconds)	511	3	9.2 (3.4)	8.3 (3.0)	None available
TUG cog (seconds)	506	8	14.3 (5.9)	12.6 (6.3)	< 9.9 [41]
Brief BESTest (score)	514	0	15.9 (5.3)	16.5 (7.0)	12.5 [42, 43]
5 Times sit-to-stand test, (seconds)	510	4	12.5 (4.3)	11.8 (4.5)	
Arm rest use	239	1	13.9 (5.2)	12.8 (9.8)	
No arm rest use	267	2	11.24 (2.8)	11.0 (7.7)	≥ 12 s to identify 2 or more falls in protocols where use of arms was not permitted [9]
Single leg stance (mean, seconds)	514	0	14.1 (16.3)	6.5 (17.0)	< 5–7.6.6 seconds [9, 44]
Gait speed (metres/second)	152	1	1.1 (0.3)	1.2 (0.4)	1–0.8 m/s [2, 45]

Table 3 Comparison of baseline sociodemographic characteristics between fallers and non-fallers in the previous 12 months

Sociodemographic Characteristics	Full sample (*n* = 514)	Fall in previous 12-months		*p* value
		No (*n* = 283)	Yes (*n* = 231)	
Age, mean (SD)	76.4 (6.7)	76.2 (6.7)	76.7 (6.7)	*p* = 0.339
Gender, *n* (%)				
Female	328 (64)	182 (55)	146 (45)	*p* = 0.867
Male	186 (36)	101 (54)	85 (46)	
Education, *n* (%)				
< Secondary school	31 (6)	20 (65)	11 (35)	*p* = 0.308
Secondary school graduation but no post-secondary education	51 (10)	31 (61)	20 (39)	
Some post-secondary education	83 (16)	44 (53)	39 (47)	
Post-secondary degree/diploma	349 (68)	188 (54)	161 (46)	
Income, *n* (%)				
<$20,000	13 (3)	3 (23)	10 (77)	*p* = 0.161
$20,000 or more but <$50,000	115 (22)	66 (57)	49 (43)	
$50,000 or more but < $100,000	210 (41)	110 (52)	100 (48)	
$100,000 or more, but <$150,000	94 (18)	53 (56)	41 (44)	
$150,000 or more	58 (11)	36 (62)	22 (38)	
Not reported	24 (5)	15 (63)	8 (33)	
Gait aid, yes *n* (%)				
Yes	126 (25)	54 (43)	72 (57)	*p* < 0.01
No	388 (75)	229 (59)	159 (41)	
Unsteady with standing/walking, *n* (%)				
Yes	270 (54)	125 (46)	145 (54)	*p* < 0.01
No	244 (46)	158 (65)	86 (35)	
Worried about falling, *n* (%)				
Yes	223 (43)	119 (53)	104 (47)	*p* = 0.557
No	291 (57)	164 (56)	127 (44)	

Table 4 Comparison of baseline balance and mobility tests between fallers and non-fallers in previous 12 months

Balance and Mobility test	Full sample ($n = 514$) Mean (SD)	Fall in previous 12-months		Mean difference	*P* value
		No ($n = 283$) Mean (SD)	Yes ($n = 231$) Mean (SD)		
TUG usual pace (seconds)	11.8 (4.0)	11.2 (3.5)	12.5 (4.5)	1.3	$p < 0.001$
TUG fast pace (seconds)	9.2 (3.4)	8.8 (3.0)	9.8 (3.8)	1.0	$p < 0.01$
TUG cog (seconds)	14.2 (5.9)	13.7 (5.5)	15.1 (6.5)	1.5	$p < 0.01$
Brief BESTest (score)	15.9 (5.3)	16.6 (5.2)	15.0 (5.4)	1.6	$p < 0.001$
5TSTS (seconds)	12.5 (4.3)	12.0 (3.9)	13.1 (4.6)	1.1	$p < 0.01$
Single leg stance (mean, seconds)	14.1 (16.3)	15.8 (16.8)	12.0 (15.5)	3.7	$p < 0.01$
Gait speed (metres/second)*	1.1 (0.3)	1.2 (0.3)	1.1 (0.3)	0.1	$p < 0.01$

*Gait speed full sample $N = 152$

significance. In fact, our sample had similar distributions in age, self-rated health, and self-rated mental health to the population-based Canadian Longitudinal Study on Aging (CLSA) [26]. With respect to fall rates, 45% of our sample had a fall in the previous 12 months. In comparison, Canadian studies examining all falls, rather than only injurious falls typically reported in administrative or population-based datasets, have found rates of 20.7% to 48.1% [46, 47]. Given that few Canadian studies have prospectively collected falls data beyond injurious events, the 1-year follow-up from INITIATE will provide important and timely insight. Regarding mobility testing, our sample also performed similarly on their baseline balance and mobility tests as participants from the CLSA [26]. Last, the entire sample answered "yes" to at least one standardized question assessing fall risk, indicating that the study sample is at risk for falls according to CPGs.

There were no sociodemographic differences between fallers and non-fallers. While both age and sex have been suggested as important risk factors for falls in some studies, this remains to be demonstrated unequivocally [10, 48]. In addition to the established question: "Have you had a fall in the past year", the Worlds Falls Guidelines suggests asking "Do you feel unsteady with standing or walking?" and "Are you worried about falling?". Interestingly, only the proportion of individuals reporting "feeling unsteady" was significantly different between fallers (n = 145, 54%) and non-fallers (n = 125, 43%) at baseline ($p <$ 0.01). These brief self-report screening tests, along with others [49], have not shown sufficient validity on their own for predicting falls; the importance of combining them with mobility tests remains to be assessed.

Our baseline findings revealed that all balance and mobility tests differentiated between participants with and without a history of falling at baseline. This is not surprising given prior cross-sectional studies demonstrating similar results for many of the measures based on fall history [20]. However, it is notable that the magnitude of the between group differences was small and for most measures fell below previously established MCID values. The three tests that did meet these thresholds, TUG, single leg stance, and gait speed, are among the most commonly used tests. However, a recent synthesis of prospective reviews examining mobility testing indicates that these assessments do not sufficiently predict future falls on their own. These findings underscore the need to evaluate their predictive validity longitudinally.

Strengths and limitations

The strengths of the INITIATE study include its prospective design with the inclusion of multiple commonly used tests of mobility and balance, the comprehensive assessment of other fall-related factors, and the rigorous falls tracking method. The limitations of this study include possible healthy volunteer bias for the majority of participants recruited via flyers, the higher education level of participants, which may have resulted in a self-selected population more aware of fall risk, the split of the data between 2020 and 2022, the addition of gait speed later in the study, and the low proportion of participants born outside of Canada.

Conclusions

This prospective cohort study was designed to directly compare the accuracy of different performance-based measures of mobility and balance for predicting future falls collected prospectively via monthly calendars over 12-months of follow-up. In the baseline results reported here, the sample appears comparable to community-dwelling older adults who would be screened for fall risk under current fall prevention guidelines. Findings from INITIATE will have direct clinical and health policy relevance for informing fall risk assessment and prevention guidelines in community-dwelling older adults.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12877-025-06724-9.

Supplementary Material 1.

Acknowledgements
We would like to thank Christina Ammerata, Evelyn Mejia, Raika Bourmand, Joanne Gorman, Nicholas Dietric, Savanna Malli, Gurpal Deol for their support with data collection.

Authors' information
SS is supported by a CIHR Banting & Best Canada Graduate Scholarship – Doctoral award.
AK None at present.
KMS holds a Canada Research Chair in Integrated Knowledge Translation in Rehabilitation Sciences.
CD is supported by a Banting Postdoctoral Fellowship award.
TN None at present.
LEG is supported by the McLaughlin Foundation Professorship in Population and Public Health.
PR holds the Endowed Raymond and Margaret Labarge Chair in Research and Knowledge Application for Optimal Aging.
JR None at present.
MS None at present.
MB holds a tier 2 Canada Research Chair in Mobility, Aging and Chronic Disease and an Early Researcher Award from the Ministry of Colleges and Universities.

Authors' contributions
SS: Acquired the data, conducted the analysis, interpreted data, and drafted the initial manuscript.AK: Co-conceived the study, designed the study, interpreted data, and revised the manuscript.KMS: Co-conceived the study, designed the study, interpreted data, and revised the manuscript.CD: Acquired the data, supported the analysis, interpreted data, and revised the manuscript.TN: Acquired the data, and revised the manuscriptLG: Designed the study, interpreted data, and revised the manuscript.PR: Designed the study, interpreted data, and revised the manuscript.JR: Designed the study, interpreted data, and revised the manuscript.MS: Designed the study, interpreted data, and revised the manuscript.MB: Conceived the study, designed the study, acquired the data, analyzed data, interpreted data, revised the manuscript, and supervised the first author.

Funding
This work was supported by Canadian Institutes of Health Research grant number PJT-165844.

Data availability
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
This study was approved by the Hamilton Integrated Research Ethics Board (#7380). All participants provided informed consent to participate in the study.

Competing interests
The authors declare no competing interests.

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Received: 20 April 2025 / Accepted: 30 October 2025
Published online: 06 December 2025

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