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Foot Problems in Older Adults Presenting to a Falls and Balance Clinic

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Keywords
Aged · Foot · Foot diseases · Podiatry · Falls

Abstract

Introduction: Foot problems, including musculoskeletal problems, peripheral neuropathy, peripheral arterial disease and dermatologic pathology are common in older adults and are associated with an increased risk of falling. Multicomponent podiatry interventions have been shown to reduce the incidence of falls. This paper aimed to identify older adults requiring podiatry input in a Falls and Balance clinic; to describe the model of foot health care they receive; to explore cross-sectional associations between foot problems and function and ultimately demonstrate the role of podiatry input in the multidisciplinary management of falls risk. ***Methods:*** Cohort study of patients attending a Falls and Balance Clinic for Comprehensive Geriatric Assessment. Demographic information was collected and functional independence, mobility, foot problems, and footwear were assessed in the clinic. ***Results:*** One-hundred and two patients were included; median age 79.3 (73–84.3) years, 68.6% female, 93.1% residing independently, 62.7% used a gait aid. Podiatry referrals were made in 80.4% of cases, with muscle weakness being the most common problem identified (90.2%); 74.8% were found to be wearing inappropriate footwear. Most patients received footwear education and half were prescribed foot and ankle strengthening exercises. Hallux and lesser toe weakness were associated with lower Short Physical Performance Battery scores ($p < 0.001$). ***Conclusion:*** The majority of older adults in the Falls and Balance Clinic required podiatry input, with foot weakness and inappropriate footwear being common reasons for referral. Those with weakness of the hallux and lesser toes had poorer balance and mobility, which is known to be associated with greater falls risk. This highlights the need for podiatry assessment and interventions as part of the multidisciplinary approach to the management of falls risk in older adults.

Introduction

Falls are a common cause of morbidity and mortality in older adults, with a third of community-dwelling adults over the age of 65 reporting at least one fall per year [1, 2]. Given falls are often the consequence of a complex interplay of medical, functional and emotional

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factors, older adults referred to a Falls and Balance clinic for management of their falls risk receive a multidisciplinary approach to care.

Foot problems are common in older adults, affecting 20–45% of those aged 65 years and over [3]. They are strongly associated with an increased risk of falls. As such, individuals referred to a Falls and Balance clinic are likely to benefit from podiatry input. "Foot problems" is an umbrella term for musculoskeletal problems (hallux valgus, hammer/claw toes, foot and ankle weakness, reduced range of motion), peripheral neuropathy, peripheral arterial disease and dermatologic pathology of the foot (corns, calluses, ulcers, fungal infection) [4]. The association between age and foot problems is due to physiological changes that commonly occur over time. With the physiological changes that often accompany older age, there is a tendency for the foot to adopt a more pronated posture as the soft tissue stiffens, the muscles weaken and its range of motion becomes reduced [5]. These changes may not only predispose the foot to structural deformity, such as hallux valgus, but also contribute to balance and gait abnormalities, decreased weight-bearing capacity and mobility impairment [6, 7]. Foot problems in older adults are associated with impaired independence in activities of daily living [8, 9] and hallux valgus, toe weakness and lesser toe deformities are independent risk factors for falls [10, 11].

Podiatrists play an essential role in improving the mobility of older adults through the diagnosis of a range of lower limb pathology and the implementation of various treatment modalities (exercise, education, footwear, excisional debridement of non-viable tissue) [12]. Multicomponent podiatry interventions that incorporate foot and ankle strengthening exercises, patient education and footwear prescriptions have been shown to be effective in reducing falls and optimising the functional independence of older adults [13]. Despite this, the importance of podiatry input in the multidisciplinary management of falls risk in older adults remains under-recognised [14, 15]. A systematic review by Wylie et al. showed podiatry referrals are only made in 32–56% of community-dwelling individuals, which is significantly lower than the prevalence of foot problems in this cohort [16]. Furthermore, only 40% of Falls and Balance clinics in Victoria, Australia are staffed with podiatrists [17].

This study aimed to (i) identify older adults who require podiatry input in a Falls and Balance clinic at a teaching hospital, (ii) describe the model of foot health care they receive, and (iii) assess associations between foot problems and physical function.

Methods

Study Design and Data Collection

This is a sub-study of "SHAPE"; a longitudinal prospective cohort study examining the relationship between muscle mass, physical activity, and nutritional status in older adults. Participants were those referred to the Falls and Balance Clinic between November 2017 and January 2019. Patients were largely referred to the clinic by their general practitioner or hospital-based clinicians due to a history of falls or a fear of falling. All patients referred to the clinic with the capacity to give informed consent were included. No exclusion criteria were applied. This study was performed in accordance with the Declaration of Helsinki and the study protocol was reviewed and approved by the Melbourne Health Human Research and Ethics Committee, approval number HREC/16/MH/346.

Patient Characteristics

Patient demographics and falls history information were collected using patient surveys, which were mailed to participants and completed before clinic attendance. The survey included demographic information and the Falls Self Efficacy Scale (FES-I), which graded individuals' fear of falling as low (16–22) or high (23–64) [18, 19].

The Comprehensive Geriatric Assessment (CGA) was performed by a multidisciplinary team including physicians, physiotherapists, dieticians, and occupational therapists and involved multiple standardised assessments. The Cumulative Illness Rating Scale (CIRS) quantified each participant's degree of medical comorbidity across multiple body systems, ranging from 0 to 56, with higher scores indicating a greater overall burden of disease [20]. Frailty was measured using the Clinical Frailty Scale (CFS), which rated patients from not frail (scores 1–3), mildly frail (4–5), severely frail (6–8) to terminally ill (9) based on their appearance, disease status, and physical independence [21, 22]. Functional independence was assessed using the Katz activities of daily living (ADL) scale, which graded participants' independence in six personal ADLs from intact (6), moderately impaired (3–5), to severely impaired (≤2) [23, 24]. Balance and mobility was assessed using the Short Physical Performance Battery (SPPB); a tool comprised of tandem stands (measured on a scale from 0 to 4), 4-metre gait speed (measured in seconds) and chair stand test times, which, together, are used to rate individuals' balance and mobility from 0 to 12 [25].

All participants underwent a physician-led standardised screening assessment at their initial appointment to determine the need for more comprehensive assessment by a podiatrist at a subsequent visit. The foot assessment tool used in this study was developed by the Falls and Balance clinic podiatrist based on common findings, clinical experience, and the available research (online suppl. material; for all online suppl. material, see https://doi.org/10.1159/000539160) [26–29]. The physician-led six-component screening assessment included patient-reported foot and ankle pain or discomfort, footwear safety assessment, inspection for corns, calluses, and ulcers, paper grip testing, and neuropathy screening. These components were identified by the Royal Melbourne Hospital Podiatry team, following a MEDLINE literature review on foot-related risk factors associated with falls [30–41]. At the time of undertaking this study, there was literature available to suggest podiatry interventions were effective in addressing foot and ankle problems and consequently reduce falls risk. Existing validated foot assessment tools were not used as they were not appropriate for the Falls and Balance Clinic cohort [42]

and other since-published screening tools were not available at the time of undertaking this study [43].

Where risk factors were identified during screening or where another clinical need for podiatry assessment was identified, a comprehensive foot assessment was then performed by a trained podiatrist on a subsequent appointment (online suppl. material). Where it was clinically indicated, the physician-led screening tests were repeated by a podiatrist. A 10-g monofilament was used to assess light touch sensation of the feet and detect peripheral neuropathy, by both physicians during screening and podiatrists during assessment [44]. Dermatologic pathologies (corns, calluses, fungal infection, and ulcers) were identified on examination and recorded. The presence of specific deformities (hammer/claw toes, hallux valgus) were identified by observation and recorded. Range of motion at the first metatarsophalangeal, subtalar, midtarsal, and ankle joints was assessed and recorded as reduced, normal, or hypermobile. Weakness of the hallux and lesser toes was defined as a failed paper grip test, performed by either physicians during screening or podiatrists during assessment [45]. Weakness of the greater foot muscles was defined as less than five out of five power in any of plantarflexion, dorsiflexion, inversion, and/or eversion. Any abnormal findings (i.e., weakness, reduced range of motion, or specific deformities) were classified as positive for musculoskeletal problems [46]. Peripheral arterial disease was defined as the presence of abnormal arterial flow (monophasic or absent) in at least one foot artery (dorsalis pedis and/or posterior tibialis) on hand-held Doppler ultrasound [47]. Footwear was assessed to be appropriate or inappropriate based on its general fit, materials, type of fixation, heel base width and height, toe box size, mid sole flexion point, longitudinal sole rigidity, and tread pattern [48].

Importantly, some elements of the vascular and neurological components of the podiatry assessment were only performed where clinically indicated based on the patient's history and/or examination. Specifically, if a patient denied tingling, burning, numbness and had no existing related neurological history (e.g., diabetes, known neuropathy) or risk factors, a monofilament test was not performed. Furthermore, where all pulses were palpable, the podiatrist did not perform further assessment using Doppler USS. Therefore, the podiatry assessment was not completed in its entirety in all individuals. Abnormal findings identified by physicians during screening and/or podiatrists during formal assessment, were classified as having that given foot problem.

Podiatry interventions included referrals to other therapists (orthotists, community podiatry, allied health, medical specialists), patient education and the prescription of foot and ankle strengthening exercises. Education consisted of brochure distribution and verbal advice about the importance of safe footwear, recommended footwear sellers, and the importance of regular foot checks and podiatry review. Where carers were present, education was provided for both the patient and their carer. Assessment outcomes and interventions were recorded in the patient's medical records before being de-identified and managed using Research Electronic Data Capture (REDCap) [49].

Statistical Analysis

Data analysis was completed using Windows SPSS version 28 (IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp). Descriptive statistics were used to summarise patient demographics and baseline characteristics. All quantitative variables were non-normal in distribution and are presented using medians and interquartile range. Categorical variables are presented as proportions (%) of the variable-specific sample size. The associations between foot problems, mobility scores (SPPB), frailty, comorbidity and functional independence were assessed using the Mann-Whitney U test at a significance level of $p < 0.05$.

Results

Clinical Characteristics

Baseline characteristics of the 102 included participants are presented in Table 1. The majority were female (68.6%) and Caucasian (87.5%), with a median age of 79.3 (11.3) years. Most participants (93.1%) were living independently (not in a nursing home or hospital); 51.6% were utilising at-home services. Overall, the group was mildly frail and functionally independent with a high fear of falling, according to the median and IQR values of the CFS (4, 1), Katz ADL (6, 1), and FES-I (43, 8) scores. Median and IQR values for the SPPB (7, 4) and 4-metre gait speed (0.8, [0.4]) suggest moderate mobility impairment within the group. On screening by physicians 82 (80.4%) of all participants (n = 102) were deemed to have signs or symptoms of foot problems requiring podiatry input. Notably, patients who attended the clinic but were not referred to podiatry did not differ greatly from the participants who were referred to podiatry in terms of demographics, functional status, frailty, or mobility.

Podiatry-Led Assessment and Management

Table 2 demonstrates the outcomes of podiatry assessment in the Falls and Balance clinic. 90.2% (n = 82) of individuals who received podiatry input had musculoskeletal foot problems, with muscle weakness being the most common finding. More than three quarters of participants (75.3%, n = 102) were wearing inappropriate footwear. As demonstrated in Table 3, patient education (comprising counselling about safe footwear, regular foot checks, and podiatry review) was the most common intervention provided (81.4%, n = 102), followed by foot and ankle exercise prescriptions (50%, n = 102).

Association between Foot Problems and Patient Characteristics

Table 4 depicts the clinical characteristics of individuals with specific foot problems to identify cross-sectional associations between foot problems and function. The presence of peripheral arterial disease was associated with greater morbidity and frailty. Foot weakness was associated with greater morbidity. Weakness of the hallux and weakness of the lesser toes were both significantly associated with poorer balance and mobility scores.

Table 1. Baseline characteristics of participants

Characteristics	Median [IQR] or *n* (%)
Social demographics	
Age, years (*n* = 102)	79.3 [73.0, 84.3]
Female (*n* = 102)	70 (68.6)
Lives at home independently[a] (*n* = 101)	95 (93.1)
At home services in use (*n* = 95)	49 (51.6)
Uses gait aids (*n* = 102)	64 (62.7)
Health characteristics	
Reports falls in previous year (*n* = 102)	89 (87.3)
FES-I score (*n* = 59)	43 [36, 44]
Low falls concern (scores 16–22)	9 (15.3)
High falls concern (scores 23–64)	50 (84.7)
CIRS score (*n* = 102)	9 [6, 12]
Clinical Frailty Score (CFS) (*n* = 101)	4 [3, 4]
Not frail (1–3), *n* (%)	49 (48.5)
Mildly frail (4–5), *n* (%)	41 (40.6)
Severely frail (6–8), *n* (%)	11 (10.9)
Katz ADL score (*n* = 102)	6 [5, 6]
Full function (score of 6), *n* (%)	57 (55.9)
Mild to moderate impairment (3–5), *n* (%)	45 (44.1)
Severe impairment (2 or less), *n* (%)	0 (0)
Total SPPB score (*n* = 82)	7 [5, 9]
4-metre gait speed, s (*n* = 89)	0.8 [0.6, 1.0]

FES-I, Falls Efficacy Scale International, CIRS, Cumulative Illness Rating Scale, ADL, Activities of Daily Living, SPPB, Short Physical Performance Battery. [a]Not in a nursing home or hospital.

Table 2. Podiatry assessment outcomes

Podiatry interventions	*n* (%)
Dermatologic problems (*n* = 102)	33 (32.4)
Peripheral arterial disease[a] (*n* = 102)	26 (25.5)
Peripheral neuropathy (*n* = 73)	32 (43.8)
Hammer/claw toe/s (*n* = 102)	29 (28.4)
Hallux valgus (*n* = 102)	29 (28.4)
Weakness[b] (*n* = 82)	74 (90.2)
Reduced range of motion[c] (*n* = 83)	64 (77.1)
Hallux weakness[d] (*n* = 79)	57 (72.2)
Lesser toe weakness[b] (*n* = 79)	56 (70.9)

[a]Abnormal Doppler USS findings (monophasic or absent) in dorsalis pedis and/or posterior tibialis in at least one foot. [b]Power <5 in at least one of plantarflexion, dorsiflexion, inversion, eversion, and/or failed hallux, or lesser toe paper grip test. [c]Reduced in at least one foot, in at least of the following joints: 1st metatarsophalangeal joint, subtalar, midtarsal, ankle. [d]Defined as failed paper grip tests.

Table 3. Interventions for foot problems

Podiatry interventions	*n* (%)
Footwear education (*n* = 102)	83 (81.4)
Foot and ankle exercises (*n* = 102)	51 (50.0)
External referral made (*n* = 102)	2 (4.8)
Clinic podiatry review scheduled[a] (*n* = 83)	58 (69.9)

[a]Scheduled for follow-up review by podiatrist in the Falls and Balance Clinic.

Discussion

Despite being a less comorbid, less frail, and more functionally independent cohort, foot problems were comparably common in older adults in this FBC when compared to inpatient populations of older adults [50]. Thus, it is likely that podiatry input is equally important in an outpatient cohort of comparably functionally independent individuals as it is in a hospital setting, where the acuity of disease is higher.

Podiatry Assessment

Podiatry referrals were made for more than 80% of patients attending the Falls and Balance Clinic following medical practitioner screening. Weakness (of both the toes and intrinsic foot muscles) and

Table 4. Foot problems and patient characteristics

Foot Problem		CIRS	CFS	Katz ADL	SPPB total score
Dermatologic problems (n = 102)	Yes	9 [7.5, 11.5]	4 [3, 5]	6 [5, 6]	6 [5, 8]
	No	9 [7, 11]	3.5 [3, 4]	6 [5, 6]	7 [5, 9]
Peripheral arterial disease[a] (n = 102)	Yes	**11 [8.8, 15]* ($p < 0.001$)**	**4 [3, 5]* ($p = 0.021$)**	5 [5, 6]	6 [3.5, 8.5]
	No	8 [6, 11]	3 [3, 4]	6 [5, 6]	7 [5.5, 9]
Peripheral neuropathy (n = 73)	Yes	9 [7, 12]	4 [3, 4]	6 [5, 6]	6 [4, 9]
	No	9 [6, 11.5]	3 [2, 4]	5 [5, 6]	9 [5.5, 9]
Hammer/claw toe/s (n = 102)	Yes	9 [7, 12.5]	4 [3, 5]	6 [5, 6]	7 [5, 9]
	No	9 [6, 11]	4 [3, 4]	6 [5, 6]	7 [5, 9]
Hallux valgus (n = 102)	Yes	8 [6, 11]	3 [2, 5]	6 [5, 6]	7 [5, 9]
	No	9 [6.5, 12]	3 [2.3, 3.8]	6 [5, 6]	7 [5, 9]
Weakness[b] (n = 82)	Yes	**9 [7, 13]* ($p = 0.03$)**	4 [3, 4]	6 [5, 6]	7 [5, 9]
	No	6 [4, 9]	3 [2.3, 3.8]	6 [5, 6]	9 [7.8, 10]
Reduced range of motion[c] (n = 83)	Yes	6 [4, 9]	3 [2.3, 3.8]	6 [5, 6]	9 [7.8, 10]
	No	9 [8, 13]	3.5 [3, 4]	6 [5, 6]	7 [6, 9]
Hallux weakness[d] (n = 79)	Yes	**9 [7, 13]* ($p = 0.02$)**	4 [3, 4.8]	6 [5, 6]	**6 [5, 9]* ($p < 0.001$)**
	No	7.5 [4, 11]	3 [2, 4]	6 [5, 6]	9 [7, 10]
Lesser toe weakness[b] (n = 79)	Yes	**9 [7.3, 13]* ($p = 0.015$)**	4 [3, 4]	6 [5, 6]	**6 [5, 9]* ($p = 0.001$)**
	No	7 [4, 11]	3 [2, 4]	6 [5, 6]	9 [7, 10]

CIRS, Cumulative Illness Rating Scale; CFS, Clinical Frailty Scale; ADL, Activities of Daily Living; SPPB, Short Physical Performance Battery. Mann-Whitney U tests, ***p** < **0.05**. [a]Abnormal Doppler USS findings (monophasic or absent) in dorsalis pedis and/or posterior tibialis in at least one foot. [b]Power <5 in at least one of plantarflexion, dorsiflexion, inversion, eversion, and/or failed hallux, or lesser toe paper grip test. [c]Reduced in at least one foot, in at least of the following joints: 1st metatarsophalangeal joint, subtalar, midtarsal, ankle. [d]Defined as failed paper grip tests.

inappropriate footwear were the most common finding during podiatry assessment (Table 2). Previous studies have identified foot problems to be of a similarly high burden in outpatient populations, affecting 87% of community-dwelling older adults in one study by Menz and Lord [7]. Both inpatient and outpatient studies have also reported a high prevalence of inappropriate footwear in their respective cohorts [50, 51]. Specific deformities such as hammer and claw toes and hallux valgus were seen in fewer participants in the Falls and Balance clinic when compared to other studies, in which hallux valgus was recognised as the most common foot problem. However, in these comparable studies, an older population was sampled, which may explain the discrepancy [7].

Peripheral neuropathy was more commonly identified in this cohort than in a study of rehabilitation inpatients [52], while peripheral arterial disease was comparatively less common in FBC patients. These differences may reflect variations in the overall health status of inpatients compared to outpatients [52].

Podiatry Management

Patient education around the importance of safe footwear, foot checks and podiatry review was the most common intervention provided by podiatrists in this clinic (Table 3). Footwear prescriptions alone have been shown to be beneficial in improving the balance of older adults, but only in the community-dwelling setting [53]. However, low compliance rates with footwear recommendations have been described in previous studies, reportedly due to the expensive nature of appropriate footwear, even with partial subsidisation [54]. Follow-up with community podiatry or longitudinal review in the Falls and Balance Clinic may be useful in increasing compliance with footwear interventions. Future studies would be useful to determine the efficacy of such follow up in increasing compliance with footwear interventions.

Weakness of the hallux and lesser toes was commonly identified during podiatric assessment of participants. Importantly, hallux and lesser toe weakness were found to be significantly associated with poorer balance and mobility, which is consistent with other studies [55, 56].

The intrinsic muscles of the hallux and lesser toes are essential in stabilising the medial longitudinal arch and grounding the toes during weight transfer. Weakness of these muscles therefore compromises the stability of the foot and impairs the balance of older adults, especially when walking [57]. Hallux and lesser toe weakness have also been identified as independent risk factors for falls, which reinforces the clinical relevance of these findings [56]. In this clinic, foot and ankle strengthening exercises were prescribed in 50% of cases, in an effort to combat weakness, improve balance and mobility, and reduce falls risk. Such exercises, even when used in isolation, have been shown to have a beneficial impact on reducing the falls rate in older adults [53].

A multifaceted approach to podiatric management (including a combination of foot orthoses prescriptions, foot and ankle exercises, and footwear education), similar to the various interventions applied in this FBC, is known to be effective in reducing the rate of falls and improving balance in older adults [16, 58]. These findings highlight the importance of podiatry involvement in falls risk reduction, more specifically, the need for appropriate footwear and prescription of foot and ankle strengthening exercises, as part of a multi-disciplinary approach to reduce falls risk.

Foot Problems and Function

No significant associations were identified between dermatologic foot lesions and frailty, functional status, frailty, mobility, and balance, which is consistent with data from the aforementioned study by Menz et al. [55]. This is postulated to be the result of the high prevalence of corns and calluses in older adults, limiting the researchers' capacity to compare outcome variables in the presence and absence of such pathology. It may also be that dermatologic foot problems such as ulcers, corns, and calluses do not precipitate functional decline until it is more severe than what would be seen in an outpatient setting, reinforcing the need for early podiatry intervention to prevent this progression.

Previous studies have also identified a significant relationship between reduced dorsiflexion range of motion and poorer performance on balance and functional testing [46, 55]. This finding was not corroborated by our analysis, which may be attributed to the near-ubiquity of reduced range of motion in this cohort.

Peripheral neuropathy was not significantly associated with poorer functional status or impaired balance or mobility in this cohort. Larger studies have identified peripheral neuropathy to be associated with poorer balance in older adult populations [55]. The presence of peripheral arterial disease, however, was significantly associated with poorer overall health status (higher comorbidity and greater frailty scores). This is unsurprising given peripheral arterial disease is commonly comorbid with cardiac failure, diabetes, and other chronic conditions, which are also associated with older age and contribute to greater overall frailty [59].

Strengths and Limitations

A number of limitations should be considered when interpreting the results of this study. Sample size calculations were not made and the sample size was small and variable across the different types of foot problems. These factors limited the author's ability to comment on the prevalence of specific problems and examine associations between foot problems and patient characteristics. Furthermore, given the individuals sampled were prone to falling, this may increase the risk of selection bias in the study. It may also explain why this study did not corroborate the findings of other researchers who identified significant associations between peripheral neuropathy, reduced dorsiflexion range of motion, and poorer function and mobility [45, 55]. Additionally, the performance of a wide range of statistical tests that explore the associations between foot problems and function may increase the risk of Type 1 error and drawing false positive conclusions. While podiatry assessments were not repeated by a second, independent, and blinded assessor, research has shown fair inter-rater reliability in the assessment of arterial disease, neuropathy, deformity, and footwear appropriateness, which reduces the risk of selection bias in this study [50]. Finally, a validated podiatric screening tool was not used due to the absence of existing, cohort-appropriate validated assessment tools at the time of the study [42, 43].

Future Directions

Future studies should seek to determine the efficacy of foot and ankle strengthening exercises, and the optimal prescription of exercises, in reducing falls risk. Given footwear education was the most frequently used form of podiatry management, follow-up study is required to determine compliance with footwear recommendations and the effectiveness of education in improving function and reducing falls risk. Further study should be performed to compare the validity of screening performed by podiatrists with that led by physicians, given this dataset included a combination

of both. Lastly, further research would prove beneficial in assessing the reliability of the screening tool for identifying patients at risk of falls attributed to foot and ankle issues. Assessing the screening tool in both outpatient and inpatient settings would enhance the detection of foot problems in these contexts, identifying individuals who would benefit most from podiatry diagnosis and intervention. This approach would aim to optimise fall prevention plans for individuals.

Conclusion

Foot weakness and unsafe footwear were commonly identified in participants attending a Falls and Balance clinic. Hallux and lesser toe weakness is associated with impaired mobility and balance, highlighting the importance of podiatry-specific interventions (foot and ankle strengthening exercises and safe footwear prescriptions) in the implementation of an effective, multidisciplinary approach to falls risk reduction in older adults.

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Statement of Ethics

This study was conducted in accordance with the Declaration of Helsinki and approved by the Melbourne Health Human Research and Ethics Committee, approval number HREC/16/MH/346. Written informed consent was obtained from all participants included in the study.

Conflict of Interest Statement

There are no conflicts of interest to declare.

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Author Contributions

Manuscript development was led by J.W. with input from all authors. J.W., R.I., A.B.M., and L.I. contributed to study concept. J.W. contributed to data analysis.

Data Availability Statement

The data that support the findings of this study are not publicly available due to their containing of information that could compromise the privacy of research participants but are available from the corresponding author (R.I.) upon reasonable request.

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