Journal of Multidisciplinary Healthcare

Dovepress
Taylor & Francis Group

Open Access Full Text Article

REVIEW

Evidence Based Strategies for Preventing Falls in Community-Dwelling Older Adults

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Objective: To evaluate and summarize the best evidence for fall prevention measures in community-dwelling elderly individuals.

Methods: A systematic search was conducted in databases including UpToDate, BMJ Best Practice, the Joanna Briggs Institute (JBI) Evidence-Based Healthcare Center, National Guidelines Clearinghouse, China Medical Guidelines Network, NICE, Scottish Intercollegiate Guidelines Network, and the Ontario Nurses' Association website. Additional searches were performed in the Cochrane Library, CINAHL, PubMed, Embase, China National Knowledge Infrastructure (CNKI), Wanfang, and VIP databases for clinical decisions, guidelines, evidence summaries, systematic reviews, and expert consensus related to fall prevention in community-dwelling elderly individuals. The methodological quality of included literature was assessed, and evidence was extracted and synthesized based on key themes.

Results: A total of 3 guidelines, 1 expert consensus, and 12 systematic reviews were included. Twenty-six pieces of evidence were summarized across 8 areas: fall risk screening, fall risk assessment, exercise interventions, medication management, environmental safety, health education, psychological interventions, and multifactorial interventions.

Conclusion: The best evidence for fall prevention in community-dwelling elderly individuals was summarized, providing an evidence-based foundation for community healthcare providers to implement fall prevention measures.

Keywords: community, older adults, falls, prevention, evidence-based nursing

Introduction

Falls are among the most common health issues affecting community-dwelling older adults, with incidence rates increasing significantly with age.[1] Studies have shown that approximately one-third of older adults living in the community experience at least one fall each year, with 10%–15% of these falls resulting in serious injuries such as fractures and head trauma. According to data from the Chinese Center for Disease Control and Prevention, about 40% of falls occur at home, 39.4% during leisure activities, and the fracture rate among older adults reaches as high as 36.84%.[2] Falls not only significantly affect the quality of life of older adults but also impose a substantial burden on healthcare systems.[3–5] Research has demonstrated that targeted exercise interventions and multifactorial risk management can effectively reduce the incidence of falls and associated injuries in this population.[6] However, awareness of fall risk remains low among older adults. Therefore, exploring effective strategies for fall prevention is essential for improving quality of life and reducing the socioeconomic burden.[7] Although both domestic and international studies have extensively examined fall prevention in the elderly, the evidence remains fragmented, making it difficult for healthcare professionals to efficiently access and apply it. This study aims to summarize the best available evidence on fall prevention in community-dwelling older adults to support the standardization of clinical practice.

Methods

Formulation of the Evidence-Based Question

An evidence-based question was developed using the PI-POST framework.[8] The target Population (P) was community-dwelling older adults; the Intervention (I) included fall risk assessment, exercise programs, and multifactorial

Received: 22 April 2025
Accepted: 3 July 2025
Published: 16 July 2025

interventions; the Providers (P) were community healthcare professionals; the Outcome (O) was the incidence of falls; the Setting (S) was the community; and the Type of evidence (T) included systematic reviews and guidelines.

Search Strategy

A top-down approach was used to search databases based on the 6S hierarchy of evidence. Databases included: UpToDate, BMJ Best Practice, the Joanna Briggs Institute (JBI) Evidence-Based Healthcare Center, International Guideline Network, China Medical Guideline Network, National Guideline Clearinghouse, National Institute for Health and Care Excellence (NICE), Scottish Intercollegiate Guidelines Network (SIGN), and the Registered Nurses' Association of Ontario. Additional searches were conducted in the Cochrane Library, CINAHL, PubMed, Embase, China National Knowledge Infrastructure (CNKI), Wanfang Data, and VIP Database for relevant evidence related to fall prevention in community-dwelling older adults.English search terms included: "accidental falls*/fall*/falls*/falling*/fallers*" "prevention*/prevent*/preventing*" "older people*/aged*/elder*/elderly*/older adult*/geriatrics*" and "community*/community-dwelling*/home*/home-based*." Chinese search terms included: "跌倒/摔倒/跌扑/摔跤/跌落/滑倒", "老年人/老人/年老/高龄", and "社区/居家/家中/院外". The search period spanned from database inception to January 6, 2025.

Literature Selection

Two researchers independently screened the literature according to inclusion and exclusion criteria, resolving any disagreements through discussion. Inclusion criteria: Community-dwelling older adults aged ≥60 years; Interventions involving fall prevention or risk assessment; Document types including guidelines, expert consensus statements, clinical decision tools, evidence summaries, and systematic reviews; Publications in Chinese or English. Exclusion criteria: Full text not available; Duplicates, outdated versions, or translated versions of the same study; Literature commentaries or interpretations; Low-quality literature, defined as quality grade C or below.

Quality Appraisal of the Literature

Two researchers trained in evidence-based methodology independently assessed the methodological quality of the included studies. Disagreements were resolved through discussion.

Guidelines were assessed using the Appraisal of Guidelines for Research and Evaluation II (AGREE II) tool,[9] with domain scores standardized and final grades classified as A, B, or C. Clinical decision tools were appraised based on the evidence level of the original references. Systematic reviews were evaluated using the JBI Critical Appraisal Checklist for Systematic Reviews (2016 version).[10] Expert consensus documents were assessed using the JBI tool for critical appraisal of expert opinion and consensus texts.[11] Evidence summaries were evaluated using the appropriate appraisal tools for evidence summaries.[9]

Evidence Extraction, Translation, Integration, and Grading

Two master's-level researchers independently extracted relevant data, including author, publication year, study type, source, and topic. The English texts were translated into Chinese using standardized terminology and plain language independently by both researchers. A fall prevention nursing expert and a PhD in evidence-based nursing reviewed the translations to resolve ambiguities and confirm optimal wording. Evidence was then extracted collaboratively by the two researchers and thematically integrated by fall risk domains. A third researcher verified the results. Integration followed these principles:①When recommendations were consistent, the version with clearer and more concise language was selected; ②When recommendations were complementary, they were merged;③In cases of conflicting recommendations, the most recent and highest-level evidence was prioritized.

Results

Literature Search and Study Selection

A total of 18,442 articles were initially identified through the database search. After removing duplicates, 2 reviewers independently screened the titles and abstracts, excluding 4,762 articles that did not meet the inclusion criteria. Full texts

of the remaining articles were assessed, resulting in the exclusion of 32 articles for not meeting eligibility requirements. Following quality appraisal, an additional 9 articles were excluded due to low methodological quality.

Ultimately, 16 articles were included in the review: 3 clinical practice guidelines,[12–14] 1 expert consensus statement,[15] 1 evidence summary,[16] and 11 systematic reviews.[17–27] The study selection process is shown in Figure 1, and the general characteristics of the included studies are summarized in Table 1.

Quality Appraisal of Included Literature

Quality Assessment of Clinical Practice Guidelines

A total of 3 clinical practice guidelines were included in this review.[12–14] The standardized domain scores and overall assessment ratings for each guideline are presented in Table 2.

Quality Assessment of Expert Consensus and Evidence Summary

One expert consensus statement was included in this review.[15] According to the 2016 JBI critical appraisal checklist for opinion and consensus papers, all items were rated as "Yes", indicating high methodological quality; the study was therefore included. One evidence summary was included.[16] Item 8, "Are the recommendations up-to-date?", was rated as "Partially", while all other items were rated as "Yes". The overall quality was deemed acceptable, and the study was included.

Quality Assessment of Systematic Reviews

A total of 11 systematic reviews were included in this study.[17–27] Quality was assessed using the 2016 JBI critical appraisal checklist for systematic reviews. The reviews by Gafner, Seaman, and Gordana were rated "Yes" on all items, indicating high methodological quality.The reviews by Biswas, Li, Chen, Lynette, and Lee had a "No" rating for the item

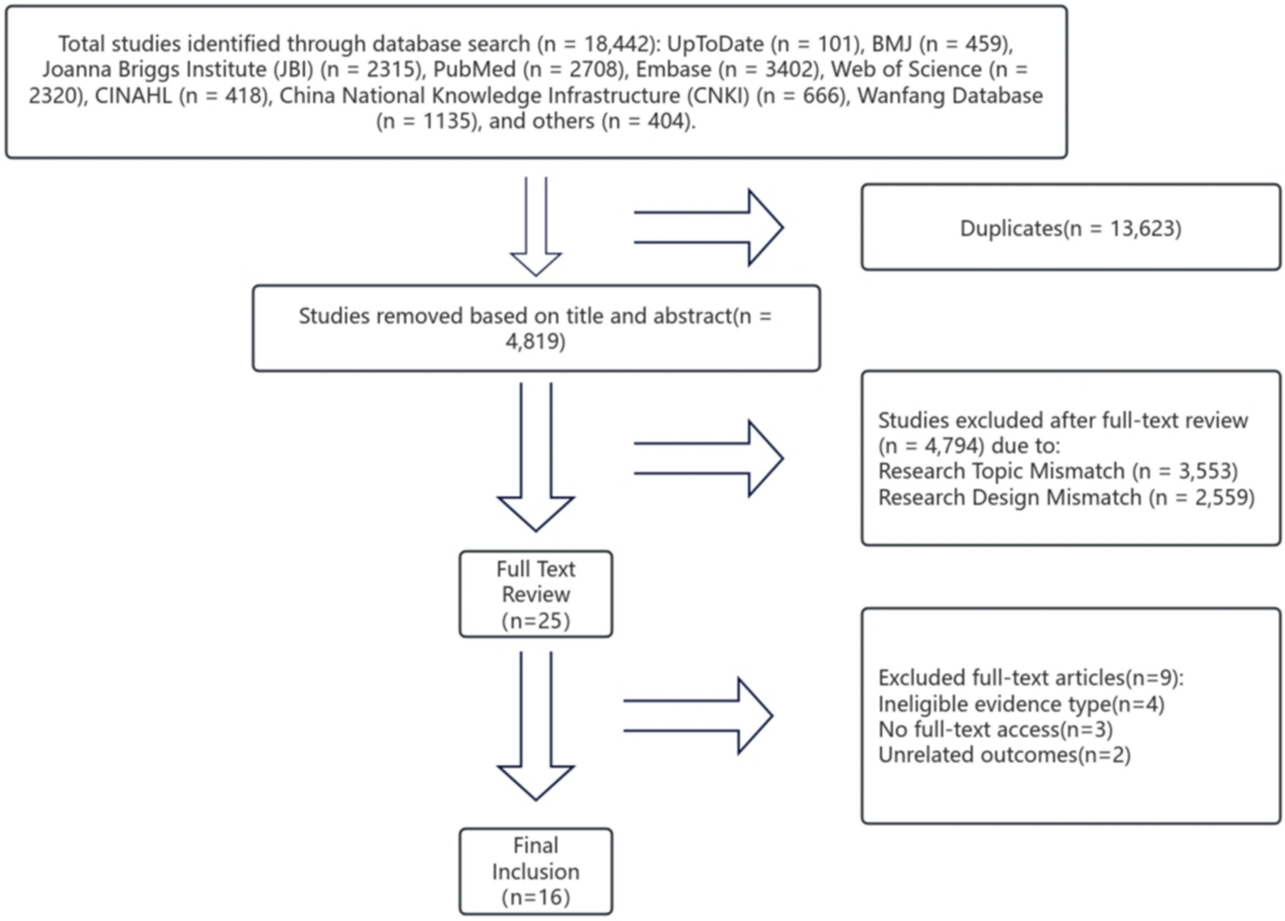

Figure 1 Screening flow chart for literature.

https://doi.org/10.2147/JMDH.S535977

Table 1 General Information of Included Studies

Author(s)	Year	Source	Evidence Type	Topic
US Preventive Services Task Force et al[12]	2024	PubMed	Guideline	Interventions to Prevent Falls in Community-Dwelling Older Adults: USPSTF Recommendation Statement
Montero-Odasso M et al[13]	2022	PubMed	Guideline	World Guidelines for Falls Prevention and Management in Older Adults
Megan Oakey et al[14]	2021	DC	Guideline	Falls Prevention: Risk Assessment and Management in Community-Dwelling Older Adults
Pi Hongying et al[15]	2022	CNKI	Expert Consensus	Expert Consensus on Comprehensive Management of Fall Risk in Older Adults
Biswas et al[17]	2022	PubMed	Systematic Review	Risk Factors for Falls in Older Adults
Li et al[18]	2023	PubMed	Systematic Review	Risk Factors for Falls in Community-Dwelling Older Adults
Tian Wenwen et al[19]	2024	Wanfang	Systematic Review	Meta-Integration of Self-Management Experiences for Fall Prevention in Community-Dwelling Older Adults
Cathleen et al[20]	2024	PubMed	Systematic Review	Risk Assessment and Prevention of Falls in Community-Dwelling Older Adults
Gafner et al[21]	2021	PubMed	Systematic Review	Effectiveness of Smart Home Technologies in Fall Prevention and Detection in Community and Residential Care Settings
Li Xiaorui et al[16]	2022	CNKI	Evidence Summary	Best Evidence Summary for Fall Risk Screening and Assessment in Community-Dwelling Older Adults
Seaman et al[22]	2022	PubMed	Systematic Review	General Practitioner Involvement in Fall Prevention Interventions for Community-Dwelling Older Adults: A Systematic Review and Meta-analysis
Ong et al[23]	2023	PubMed	Systematic Review	Fall Risk Screening Tools Aimed at Reducing Fall Risk in Independent Community-Dwelling Older Adults
Chen et al[24]	2024	PubMed	Systematic Review	Effectiveness of Smart Home Technologies in Fall Prevention and Detection in Older Adult Community and Residential Care Settings
Mackenzie et al[25]	2020	PubMed	Systematic Review	General Practitioner Involvement in Community Fall Prevention: A Systematic Review and Meta-analysis
Gordana et al[26]	2020	PubMed	Systematic Review	Effects of Virtual Reality on Fall Incidence Among Community-Dwelling Older Adults
Lee et al[27]	2024	PubMed	Systematic Review	Effectiveness of Information and Communication Technology in Fall Prevention Interventions for Older Adults

https://doi.org/10.2147/JMDH.S533977

Table 2 Evaluation Results of Included Guidelines

Author	Scope and Purpose (%)	Stakeholder Involvement (%)	Rigor of Development (%)	Clarity of Presentation (%)	Applicability (%)	Editorial Independence (%)	Domains ≥60% (n)	Domains ≥30% (n)	Grade
US Preventive Services Task Force[12]	94.44	91.67	92.71	95.83	93.75	95.83	6	6	A
Montero-Odasso[13]	93.06	90.28	93.75	94.44	92.71	91.67	6	6	A
Megan Oakey (BC)[14]	97.22	93.06	67.19	94.44	65.62	91.67	6	6	A

"Is the review question clearly and explicitly stated?" but received "Yes" ratings for all other items. The overall quality was considered acceptableThe review by Tian Wenwen received "No" ratings for "Is the review question clearly and explicitly stated?" and "Was the likelihood of publication bias assessed?" All other items were rated "Yes", and the review was included based on overall acceptable quality.The review by Cathleen was rated "No" for three items: "Is the review question clearly and explicitly stated?", "Were the inclusion criteria appropriate?", and "Was the appraisal tool used appropriate for assessing methodological quality?" All other items were rated "Yes". The overall quality was acceptableThe review by Ong was rated "Unclear" for the item "Was critical appraisal conducted by two or more reviewers independently?" All other items were rated "Yes", and the study was included based on acceptable overall quality. Details are presented in Table 3.

Evidence Synthesis and Analysis

The evidence levels of the included studies were standardized using the 2014 JBI Evidence Level and Grade System. The strength of recommendations was determined based on the JBI FAME framework and grading criteria, categorized as Grade A (strong recommendation) and Grade B (weak recommendation). Eight strategies for fall prevention were identified, encompassing 26 specific recommendations: fall risk screening, fall risk assessment, exercise interventions, medication management, environmental safety, health education, psychological interventions, and multifactorial interventions. Details are presented in Table 4.

Discussion

Multifactorial Fall Risk Screening and Assessment Strategies

Items 1 through 6 of the included evidence primarily focus on fall risk screening and assessment among community-dwelling older adults. Risk factors for falls in this population span multiple domains, including a history of falls, intrinsic physiological impairments, comorbidities, use of assistive devices, and environmental hazards. The multifactorial nature of these risks presents challenges in accurately identifying individuals at high risk. Numerous assessment tools have been proposed in previous studies. Although the combined use of multiple tools is common in practice, the effectiveness of such approaches remains limited.[23] Current guidelines recommend the use of the "Screening Tool for Risk Stratification and Management of Falls in Community-Dwelling Older People" from the World Guidelines for the Prevention and Management of Falls in Older Adults for preliminary screening of fall history, balance, and gait.[14] For individuals who screen positive, a comprehensive, multidisciplinary evaluation of fall risk is advised. The "Stay Independent Brochure", recommended by the US Centers for Disease Control and Prevention (CDC), is one of the widely used tools for fall risk screening in community settings.[14] This tool uses a brief questionnaire to assess risk factors such as history of falls, medication use, vision problems, and issues with balance and gait. It demonstrates high sensitivity for preliminary screening and facilitates both self-assessment by older adults and rapid evaluation by healthcare providers. However, as it relies on self-reported information, its specificity is relatively low, which may lead to false positives. Therefore, individuals who screen positive should undergo further assessment using quantitative tools. Studies have shown that relying solely on the Stay Independent Brochure may be insufficient for accurate fall risk prediction. Combining it with objective assessment tools, such as the Timed Up and Go Test (TUGT) and the Berg Balance Scale, is recommended to enhance the accuracy and reliability of the evaluation.13 This integrated approach allows for a more comprehensive assessment of individual risk and provides a stronger foundation for tailored interventions. Multifactorial fall risk assessments typically integrate a variety of measurement tools and methods across different dimensions, including physical function (eg, TUGT, Berg Balance Scale), psychological status (eg, Falls Efficacy Scale, Activities-specific Balance Confidence Scale), and environmental hazards (eg, Home Hazard Assessment Tools). Each tool offers distinct advantages in terms of sensitivity and specificity. The literature suggests using simple, user-friendly tools (such as the Stay Independent Brochure) for initial screening, followed by multidisciplinary evaluations that combine various tools for those who screen positive. Despite the high sensitivity and specificity associated with the combined use of tools, challenges remain in implementation due to complexity and resource demands. Future research should focus on optimizing the balance between simplicity and accuracy to improve the feasibility and scalability of fall risk assessment in community-dwelling older populations.

Table 3 Methodological Quality Appraisal of Included Systematic Reviews (n=12)

Appraisal Item	Biswas[17]	Li[18]	Tian[19]	Cathleen[20]	Gafner[21]	Li XR[16]	Seaman[22]	Ong[23]	Chen[24]	Mackenzie[25]	Gordana[26]	Lee[27]
1. Is the review question clearly and explicitly stated?	No	No	No	No	Yes	No	Yes	Yes	No	No	Yes	No
2. Are the inclusion criteria appropriate for the review question?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3. Is the search strategy appropriate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4. Are the sources and resources used to search for studies adequate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5. Are the criteria for appraising studies appropriate?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6. Was critical appraisal conducted by two or more reviewers independently?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes
7. Were there methods to minimize errors in data extraction?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8. Were the methods used to combine studies appropriate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9. Was the likelihood of publication bias assessed?	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
10. Were recommendations for policy and/or practice supported by the data?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11. Were specific directives for new research appropriate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Overall Rating	High	High	High	High	High	High	High	High	High	High	High	High

Notes: Adapted from Aromataris E, Fernandez R, Godfrey C, Holly C, Kahlil H, Tungpunkom P. Summarizing systematic reviews: methodological development, conduct and reporting of an Umbrella review approach. *Int J Evid Based Healthc.* 2015;13(3):132-40.

Table 4 The Best Evidence for Preventing Falls in Community-Dwelling Older Adults

Evidence Category	Evidence Description	Level of Evidence
Fall Risk Screening	(1) Community-dwelling elderly individuals should undergo fall risk screening, particularly targeting high-risk factors such as fall history, physiological structure and function, comorbidities, medication factors, personal factors, and environmental factors[13–19]. (Table S1)	Level 1a
	(2) The "World guidelines for falls prevention and management for older adults: a global initiatives" recommend the use of the "Community Fall Risk Stratification and Management Screening Tool" for systematic screening.[13]	Level 5a
Fall Risk Assessment	(3) For elderly individuals with positive screening results, a multidisciplinary professional team is recommended to conduct a multifactorial assessment to comprehensively understand their fall risks.[17–20]	Level 1a
	(4) It is recommended to use tools such as the Stay Independent Brochure (SIB) and potential multifactorial fall risk assessment instruments and methods as part of the assessment process.[14,17,18]	Level 1a
	(5) For fall risk stratification, it is recommended to use the "3-Key-Questions" (3KQ) scale combined with the Stay Independent Brochure to screen and stratify fall risk, so that appropriate preventive measures can be taken for elderly individuals at different risk levels.[14]	Level 5a
	(6) Multidisciplinary and multifactorial assessments are recommended, using multifactorial fall risk assessment tools and methods to provide a comprehensive evaluation for community-dwelling elderly individuals, identifying and addressing multiple dimensions of fall risk.[12–14]	Level 1a
Exercise Intervention	(7) Effective exercise interventions can provide multiple health benefits and help prevent falls.[12–14,16,19,22–24]	Level 1a
	(8) Recommended types of exercise: Common exercises include gait, balance, and functional training, strength and resistance training, as well as flexibility and endurance training. It is recommended to integrate telemedicine or smart devices for monitoring exercise data.[18–20]	Level 1a
	(9) The effectiveness of three-dimensional exercises: Three-dimensional exercises have shown significant effects in fall prevention. Examples include group dancing or Tai Chi classes that involve movements covering all three spatial planes or dimensions.[12–14,16,20–23]	Level 1a
	(10) Recommended tools and programs: Including Wii Fit balance training* and eHealth exercise programs*, which help improve balance in elderly individuals. Specific training activities include headball, skiing turns, balance balls, and yoga, among others.[16,21–25]	Level 1a
	(11) Recommended gait adaptability training: Includes low-tech gait/walking training, multitask-based gait/walking training, exergames, and virtual reality obstacle courses.[21,26,27]	Level 1a
	(12) Recommended balance and strength training: Compared to other types of training, balance and strength training are especially beneficial in preventing falls.[16,20–24]	Level 1a
	(13) Recommended strength and resistance exercise training: Elderly individuals in the community are advised to perform strength training for the large muscle groups of the legs and hips, including exercises with light dumbbells, resistance bands, and bodyweight training such as squats or sit-to-stand exercises.[22–25]	Level 1a
	(14) Recommended exercise frequency: Various exercise programs should be performed at least 2–3 times per week for a duration of no less than 12 weeks, with the option to extend the training period based on outcomes.[12–14]	Level 1a
Medication Management	(15) Prescription considerations: When prescribing medication, physicians are advised to consider characteristics of elderly individuals who are taking medications at home, including frailty, polypharmacy, comorbidities, life expectancy, personal preferences, and other geriatric syndromes.[14]	Level 5a
	(16) Medication review recommendations: It is recommended to use the Algorithm of Medication Review in Frail Older People and regularly conduct medication reviews to ensure the safety and effectiveness of medications used by community-dwelling elderly individuals.[14]	Level 5a
Environmental Safety	(17) Characteristics of hazardous environments: Slippery floors, loose carpets, smooth staircases, poor lighting, narrow spaces, cluttered arrangements, unreasonable furniture layout, lack of handrails or assistive devices in bathrooms and staircases, uneven surfaces, and unprotected stairs.[14]	Level 1a
	(18) Characteristics of safe environments: Barrier-free design, good lighting, appropriate assistive devices (including handrails, grab bars, non-slip mats, anti-slip shoes, walkers, etc)., rational furniture layout, reduction of narrow passages, and avoidance of raised carpet edges or other tripping hazards.[14]	Level 1a
	(19) It is recommended to use the Home Fall Hazards Assessment (HFHA) tool to assess the safety of living environments for community-dwelling elderly individuals.[23]	Level 1a

(*Continued*)

Table 4 (Continued).

Evidence Category	Evidence Description	Level of Evidence
Health Education	(20) Recommended participants: It is advised that registered nurses, community nurses, public health nurses, nurse assistants, and home care nurses actively participate in providing fall prevention education (FPE) to community-dwelling elderly individuals, enhancing their awareness of fall risks and prevention skills.[12–14,22]	Level Ia
	(21) It is recommended to use the Health Belief Model (HBM) as the theoretical framework for health education on fall prevention in older adults.[16,24]	Level Ia
	(22) Topics to be included in health education interventions: Identification of health conditions that increase fall risk, prevention of falls at home, the benefits of exercise for fall prevention, and the role of nutrition in fall prevention.[12–14,16,20–23]	Level Ia
	(23) The choice of health education should be based on the fall risk assessment of the elderly: single intervention—where the elderly receive education on a single topic directly related to fall prevention; multi-component and multifactorial educational interventions—covering two or more topics directly related to fall prevention.[14]	Level Ia
Psychological Interventions	(24) It is recommended to encourage community-dwelling elderly individuals to make positive changes in their lifestyle and environment and to encourage family members to provide guidance to elderly individuals on self-care to reduce fall risk.[16,22–25]	Level Ia
	(25) Recommended methods include mindfulness therapy and cognitive-behavioral therapy (CBT).[14]	Level Ia
Multifactorial Intervention	(26) Based on the assessment of specific fall risk factors in elderly individuals (such as physical decline, medication use, environmental risks, etc)., personalized intervention plans should be developed, incorporating two or more intervention measures (such as exercise training, medication adjustments, environmental improvements, and health education) to reduce fall risk.[12–14]	Level Ia

Exercise Interventions: Effectiveness and Implementation Parameters

Items 7 through 14 address the benefits, types, and frequency of exercise interventions. Studies have shown that well-designed physical activity programs can effectively enhance muscle strength, balance, and gait stability in older adults, thereby reducing the incidence of falls and fall-related injuries.[12–14] For example, exercises such as single-leg stands and heel-to-toe walking have been shown to improve lower limb strength and balance.Systematic reviews have found that exercise programs combining balance and functional training reduce fall rates by approximately 30% to 40% compared with control groups. Another study demonstrated that participating in exercise at least 2 to 3 times per week for more than 12 weeks significantly improved balance and muscle strength, resulting in a 35% reduction in fall risk in the intervention group.[28] Strength training has been shown to markedly improve lower limb muscle strength and reduce the risk of falls. Community-dwelling older adults are encouraged to engage in resistance exercises targeting major muscle groups of the legs and hips using tools such as dumbbells and resistance bands.[28] Three-dimensional (3D) exercise—defined as movement involving all three spatial planes, such as group dance classes or Tai Chi—has also been associated with improved coordination and spatial awareness, leading to a 30% to 40% reduction in fall risk.[12–14] In addition, systematic reviews suggest that the integration of smart devices to monitor activity metrics may further reduce the incidence of falls.

Structured Medication Review for Fall Risk Mitigation

Items 15–16 primarily address medication management for fall prevention among community-dwelling older adults. When prescribing medications, clinicians should consider age-related factors such as frailty, polypharmacy, comorbidities, life expectancy, personal preferences, and geriatric syndromes. The BC Clinical Practice Guidelines and Protocols in British Columbia recommend a structured medication review process in the Community-Dwelling Older Adults: Risk Assessment and Management guideline to enhance medication safety and reduce fall-related risks in the elderly population.15This process includes: (1) conducting a comprehensive medication history to record all prescription medications, over-the-counter drugs, and natural health products—documenting name, dose, indication, and adverse

reactions; (2) identifying high-risk medications associated with falls, evaluating their indications, and avoiding "prescribing cascades", in which side effects are misdiagnosed as new conditions, leading to unnecessary prescriptions; (3) optimizing regimens by prioritizing medications that alleviate symptoms or prevent deterioration, balancing immediate benefits, short-term risks, and the feasibility of non-pharmacologic alternatives. Trial discontinuation may be considered where appropriate. Medication regimens should be dynamically adjusted based on changes in patient health status and care environment, including dose adjustments, substitution with non-drug interventions, or deprescribing.This systematic approach has been shown to reduce fall risks caused by adverse drug reactions, thereby improving medication safety and quality of life for older adults in the community.

Environmental Hazard Modification: Home Safety Interventions

Items 17–19 highlight the role of environmental safety in fall prevention. Studies suggest that 30% to 50% of falls are attributable to environmental hazards. Environmental interventions—targeting home, community, and public space modifications—can effectively reduce fall risk.13–15 Strategies include the provision of assistive devices (eg, grab bars, walkers), behavioral and material adaptations (eg, securing rugs, avoiding ladder use), and structural changes (eg, improved lighting).The Home Falls and Accidents Screening Tool (HFHA) is widely used to systematically assess potential fall risks in the home, evaluating factors such as flooring, lighting, stairs, bathrooms, furniture layout, and assistive equipment.24 Higher HFHA scores indicate greater fall risk. Targeted interventions based on HFHA findings can enhance home safety and improve quality of life for older adults.

Integrated Health Education and Psychological Interventions

Items 20–25 discuss the role of health education and psychological interventions. Evidence supports the critical role of community-based healthcare teams—including registered nurses, public health nurses, and nursing assistants—in fall prevention education (FPE) through improved risk awareness among older adults and their families.[22] The Health Belief Model (HBM) is recommended as a theoretical framework to enhance understanding of fall risks and promote preventive behaviors.The BC guideline recommends core FPE topics such as identifying fall risk factors (eg, vision impairment, gait instability, medication use), preventing home hazards (eg, removing obstacles, optimizing lighting), the benefits of exercise (eg, balance and strength training), and the importance of nutrition for bone health (eg, vitamin D supplementation, dietary adjustments).[12–14]Based on individual fall risk assessments, FPE may be tailored as single-component, multicomponent, or multifactorial interventions. These programs provide older adults with actionable strategies to reduce fall risk and improve quality of life.Psychological interventions recommended in the literature include cognitive behavioral therapy (CBT), emotional support, behavioral therapy, and educational training.[14] These approaches help older adults recognize and address negative thought patterns, alleviate anxiety and loneliness, and enhance self-efficacy and awareness of fall prevention. Key strategies emphasize individualized intervention, active learning, and self-awareness, with interactive education and feedback mechanisms improving engagement and self-management capabilities.Previous studies show that such interventions significantly reduce fear of falling (40%), anxiety (35%), and improve physical activity (25%) and self-confidence (30%), leading to better quality of life and strengthened social support networks.[29]

Multifactorial Interventions: Evidence Synthesis and Clinical Translation

Item 26 describes multifactorial interventions, which begin with an initial assessment of fall risk factors and subsequently provide individualized, targeted strategies based on identified issues. These interventions include two or more components tailored to an individual's specific risk profile.Interventions may encompass individual or group exercise, psychological therapies (eg, CBT), nutritional support, education, medication review, urinary incontinence management, environmental modifications, physical or occupational therapy, community/social services, and referrals to specialists (eg, ophthalmologists, neurologists, cardiologists).A 2018 Cochrane systematic review by Cameron et al[30] demonstrated that multifactorial interventions reduced fall incidence by 23% in community-dwelling older adults. These programs are personalized based on fall risk profiles and may involve exercise combined with home safety advice, medication review, and supervised physical activity.

Conclusion

Falls among older adults represent a significant public health concern that impacts both health outcomes and quality of life. They also pose a central challenge for community-based healthcare services. Although current research has shown some success in reducing fall risk, the ongoing trends of population aging and increasing diversity of needs call for further optimization of prevention strategies.With advancements in personalized interventions, smart technologies, psychological support, health education, and the integration of policy and resources, fall prevention is expected to become more precise and locally adapted. However, most of the interventions included in this study were based on short-term follow-up, with limited evaluation of long-term effectiveness. In addition, much of the evidence was derived from Western countries, lacking consideration of cultural and environmental factors specific to developing countries such as China, which may limit the applicability and localization of the strategies.

Data Sharing Statement

Please see individual studies referenced for data availability.

Institutional Review Board Statement

Ethical review and approval were waived for this review due to the lack of animal or human subjects research that had not previously been published.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the studies referenced in this review.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

Zhongshan City Social Welfare Science and Technology Research Project, number 2022B1043.

Disclosure

The authors declare no conflicts of interest in this work.

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