Falls efficacy instruments for community-dwelling older adults: A COSMIN-based systematic review

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Abstract

Background Falls efficacy is a widely-studied latent construct in community-dwelling older adults. Various self-reported instruments have been used to measure falls efficacy. Empirical evidence is needed to justify the selection of a specific instrument to measure the intended construct.

Methods To summarize evidence on the development, content validity and structural validity of instruments measuring falls efficacy in community-dwelling older adults using the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) checklist. MEDLINE, Web of Science, PsychINFO, SCOPUS, CINAHL were searched (May 2019). Records on the development of instruments and studies assessing content validity or structural validity of falls efficacy related scales were included. COSMIN methodology was used to guide the review of eligible studies and assessed their methodological quality. Evidence of content validity: relevance, comprehensiveness and comprehensibility and unidimensionality for structural validity were synthesized. A modified GRADE approach was applied to evidence synthesis.

Results 35 studies, which had 18 instruments identified, were included in the review. High-quality evidence showed that the modified Falls Efficacy Scale (FES)-13 items (mFES-13) has sufficient relevance but insufficient comprehensiveness for measuring falls efficacy. Moderate quality evidence supported the FES-10 has sufficient relevance and mFES-14 has sufficient comprehensibility. Activities-specific Balance Confidence (ABC) Scale–Simplified (ABC-15) has sufficient relevance to measuring balance confidence supported by moderate-quality evidence. Low to very low quality evidence underpinned the content validity of other instruments. High-quality evidence supported sufficient unidimensionality for eight instruments (FES-10, mFES-14, ABC-6, ABC-15, ABC-16, Iconographical FES (Icon-FES), FES–International (FES-I) and Perceived Ability to Prevent and Manage Fall Risks (PAPMFR)).

Conclusion Content validity of instruments to measure falls efficacy is understudied. Structural validity is sufficient for a number of widely-used instruments. Measuring balance confidence is a subset of falls efficacy. Further work is needed to investigate a broader construct of falls efficacy.
Escalating consumption of healthcare services globally associated with high rates of falls-related morbidity in rapidly ageing demographics is a major public health concern among policymakers, researchers and clinicians (1-3). Falls efficacy might be improved usefully in the older adults to maximize their independence and promote maintenance of an active lifestyle and counter burdensome associations (4). Falls efficacy as a latent construct in community-dwelling older adults is widely studied in research and clinical practice (5). Conceptualized using Bandura’s self-efficacy theory (6), assessing falls-related self-efficacy conventionally focuses on beliefs and confidence about one’s ability to undertake activities of daily living without falling (7). Over the last three decades, falls efficacy has been studied alongside with other falls-related psychological constructs i.e. fear of falling and balance confidence (8). Commonly-used self-reported instruments include the Falls Efficacy Scale (FES) (7), modified Falls Efficacy Scale (mFES) (9), Activities-specific balance confidence scale (ABC) (10), CONFBal scale of balance confidence (CONFBal) (11), Falls Efficacy Scale-International (FES-I) (12) and Iconographical Falls Efficacy Scale (Icon FES) (13). Selecting appropriate instruments to measure falls efficacy is obscured by operational heterogeneity amongst these relevant psychological constructs of fear of falling and balance confidence (8). High-quality psychometric evidence should necessarily underpin the selection of specific instruments.

Researchers and clinicians have used different instruments to measure falls-related psychological constructs interchangeably. The first of such scale, FES (7), was developed in 1990. The instrument was underpinned by established theoretical models of cognitive process underlying emotions, has been used to measure fear of falling i.e. low falls efficacy scores to indicate high fear of falling in the older adults (7). However, this conflation of related or mediating but essentially distinct theoretical constructs has been criticized. Falls efficacy had been shown to mediate in the relationship between fear of falling and falls (14), and that both concepts can be influenced differently by psychological concepts, including depression (15). Expansive assessment scales with good psychometric properties i.e. The Survey of Activities and Fear of Falling in the Elderly (SAFE) (16), The University of Illinois at Chicago Fear of Falling Measure (UICFFM) (17) and the Geriatric fear of falling measure (GFFM) (18) have facilitated broader understanding of fear of falling amongst other emotional (e.g. anxiety) and
behavioural (e.g. activity avoidance) psychological elements. Since the mid-90s, other instruments were further developed to address the FES’s varied limitations, including the ABC (10), shown to be highly correlated to the FES (.86) (19), measuring balance confidence within broad-ranging assessments of functional activities. The abbreviated ABC (10) version, ABC-6 (20) was developed from patient groups with Parkinson’s disease and high-level gait disorders reporting their highest fear in their task performance. By the end of the 2000s, instruments to assess ‘falling-related self-efficacy’ focused on balance confidence, or the perceived ability to perform functional tasks without losing balance. CONFbal was developed focusing on individuals’ cognitive (belief) rather than emotional (fear) constructs with the intent of physiotherapy-focused rehabilitation training (11). Some evidence, including that from systematic reviews of falls-related psychological concerns in community-dwelling older adults, suggest assessing falls efficacy and balance confidence synonymously due to commonality of items amongst instruments (21). By contrast, conflicting evidence has challenged accepting balance confidence and falls efficacy as isomorphic constructs. For example, a recently developed scale, Perceived Ability to Prevent and Manage Fall Risk (PAPMFR) measures a wide range of fall-related perceptions and treats falls efficacy conceptually as a broad entity (4).

Previous efforts were made to recommend ‘gold standard’ instruments for specific falls-related psychological constructs for clinical use in two antecedent systematic review. Jostad and colleagues (2006) (22) presented key measurement properties of the different instruments, including details of the populations in which measures have been tested and information on scaling, to aid researchers and clinicians with their selection of an instrument. Moore and colleagues (2008) (8) focused attention on psychometric properties of common instruments used in independent-living and community-dwelling older adults and recommended that mFES, FES-I and ABC could be used to measure falls efficacy and balance confidence. However, neither antecedent review offered a critical evaluation of each instrument’s content validity and thus, empirical evidence to justify its use, nor indeed, the inherent quality of the evidence. Content validity, which refers to “the degree to which an instrument measures the construct it purports to measure”, would provide empirical evidence to justify the use of appropriate instruments (23). Countering this fundamental gap in the literature would be expected to
facilitate confidence among researchers and clinicians in their selection of instruments to measure falls efficacy.

Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) methodology facilitates systematic review of measurement instruments and offers a hierarchical psychometric process by which any endorsed instrument will have needed to satisfy priority and bias-free evidential thresholds of content validity and structural validity (i.e. scores of an instrument adequately reflect the dimensionality of the construct to be measured) (24). Thus, transparent and evidence-based recommendations can be made for the selection of appropriate instruments to measure intended constructs (25). To the best of the authors’ knowledge, there have been no systematic reviews that had adopted the COSMIN methodology to evaluate falls efficacy-related instruments. The purpose of this paper was to systematically review content and structural validity of falls efficacy-related scales for the community-dwelling older adults, using COSMIN guidelines.

Methods

Protocol and registration

This review was conducted in accordance with the Preferred Reporting Items of Systematic Reviews and Meta-Analyses Protocol (PRISMA) guidelines (26) (Additional file 8). A protocol for this systematic review is registered in PROSPERO (Ref-CRD42019124366) (27).

Eligibility criteria

Studies were included if instruments were measuring constructs relating to ‘falls-efficacy’, ‘falls-related self-efficacy’ and ‘balance confidence’ in community-dwelling older adults including translated and culturally adapted versions of these instruments. Studies were excluded if titles related to and measured constructs such as ‘fear’, ‘anxiety’ and ‘activity avoidance’

Search strategy and selection criteria

A comprehensive language-unrestricted search was conducted between 1st January 1990 and 31st May 2019 amongst Medline (EBSCOhost), Web of Science Core Collection, PsychInfo (EBSCOhost),
Scopus (scopus.com) and Cinahl Plus with full text (EBSCOhost) databases. COSMIN-guided searching consisted of three groups of search terms combined with Boolean operators, detailing: (1) construct of interest, (2) target population and (3) measurement properties (see Additional file 1).

Studies reporting the development of falls efficacy related instruments measuring falls efficacy or balance confidence were included for the assessment of content validity (Table 1). Content validity studies were eligible if they were full-text original articles, about community-dwelling older adults or professionals (e.g. falls-related researchers, clinicians) to assess the relevance, comprehensiveness, or comprehensibility of the content of at least one instrument. Instruments’ cross-cultural adaptation studies were included, if comprehensibility pretesting of the adapted questionnaire within the target population had been performed. Similarly, the availability of content validity studies for instruments in comparable populations guided inclusion. Structural validity studies were included only as full-text original articles about community-dwelling older adults, assessing instrument dimensionality via factor or item response theory analysis (28).

Two independent reviewers (SS; CWT) interrogated database-derived titles and abstracts for eligibility and subsequently, full texts for potential inclusion. The consensus was sought, but any disagreements were resolved by an additional team-based reviewer.

**Quality assessment and data extraction**

The COSMIN checklist guided assessment about methodological quality of studies detailing an instrument’s development, content validity and structural validity (28, 29). The 35 criteria ensured the relevance of an instrument’s items and quality amongst cognitive interviewing or other piloting of comprehensibility and comprehensiveness. A further 31 criteria assessed a study’s methodological quality of content validity involving the relevance, comprehensiveness, and comprehensibility within the target population, and relevance and comprehensiveness amongst professional participants. Four criteria evaluated the appropriateness of the statistical methods assessing structural validity of an instrument. Criteria were characterized on 4-point rating scales as “very good”, “adequate”, “doubtful” (reflecting methods that were not described clearly) or “inadequate” (methods not
described), with overall ratings regulated by recording lowest rating among relevant items (28).
Ultimately, overall ratings about studies’ methodological qualities influenced the interpretation of
evidential quality of the psychometric measurement property of the instrument (24).
Measurement properties of studies were evaluated via COSMIN and their distribution amongst three
pairings of two reviewers (SS, CWT; SS, JL; SS, TX), with discussions determining consensus.
Information extracted included the construct to be measured, target population, and context of use
(instrument development studies); patient characteristics (concept elicitation and cognitive interview
studies; validity studies); and results (validity studies). Data were extracted by the first reviewer in a
pairing, while the second reviewer double-checked the accuracy of the extracted information.

**Evidence synthesis**

Three steps were conducted to synthesize evidence by each pairing of reviewers (S.S, C.W.T; S.S, J.L;
S.S, T.X). First, the results of instrument development and content validity studies were rated
according to guided criteria to evaluate relevance, comprehensiveness and comprehensibility. Each
criterion was rated as sufficient (+), insufficient (-) or indeterminate (?). Second, an overall result was
obtained by pooling all the results of all available studies and reviewers’ ratings on the same
instrument (irrespectively of language and country) (28). The studies on structural validity were rated
according to a recommended criteria guide published by Prinsen and colleagues (see Additional file 2)
(24). The overall structural validity of the instrument was rated as sufficient (+), insufficient (-),
inconsistent (±) or indeterminate (?), taking all evidence into the account. Third, the quality of
evidence was rated according to a modified GRADE approach taking into account the study quality,
consistency of results across studies and reviewers’ rating (for content validity only). The overall
rating was graded for the quality of the evidence using a modified GRADE approach (high, moderate,
low or very low) (24).

**Results**

From an initial 2058 records, 95 were retrieved for full-text review, and 24 were selected (Figure 1).
71 records were excluded: 44 did not include constructs relating falls-related self-efficacy or balance
confidence, 11 assessed other measurement properties, six did not assess measurement properties, two were conducted on different populations, two were abstracts, one was a thesis, one was in citation and four were written in other languages (i.e. Persian, German, Dutch). 35 included records: 24 full-text articles meeting eligibility criteria and 11 additional articles from citation tracking, were used to evaluate instrument development (16 studies), content validity (33 studies) and structural validity (14 studies).

**Content validity**

**Quality of instrument development studies**

A summary of the studies detailed construct definition, target population, and the intended context of use for the 18 instruments was presented (see Additional file 3). Nine studies were related to scales measuring falls efficacy. Four studies were related to the construct of balance confidence. Three studies were related to scales with the title relating to falls efficacy but measured concerns about falling than constructs relating to falls efficacy or balance confidence.

Concept elicitation was identified as inadequate for 15 instruments because no target population had been involved in their development. For the other instruments (i.e. ABC-16, CONFBal and Mobility Efficacy Scale (MES)), concept elicitation was doubtful because of unclear methods. Among all studies relating to an instrument’s development, only Icon-FES featured cognitive interviews with older adults. However, the quality of cognitive interviews was doubtful because older adults’ characteristics and methodology of the interview process were not described.

**Quality and results of content validity studies**

47 studies were reviewed for content validity of the instruments. 34 studies had involved a target population (see Additional file 4), with 13 studies involving professionals (see Additional file 5). No studies on the content validity of Gait efficacy scale (GES)-8 were found. Among all instruments, ABC-16 had the highest number of 18 studies conducted involving older adults (32%) and professionals (54%) respectively. For those scales involving the target population in assessing content validity, only
one study (mFES-13) was of adequate quality to assess its relevance, comprehensibility and comprehensiveness. Two studies on relevance (FES-10 and ABC-6) were of inadequate quality, one study on comprehensibility (FES-10) was of inadequate quality. Fifteen content validity studies involving target populations were cross-cultural adaptations that included a pretest of the translated instruments. In these studies, 6 studies assessing relevance were of doubtful quality and 6 studies assessing comprehensibility were also of doubtful quality. All other studies were of either inadequate or indeterminate quality. None of the studies assessed comprehensiveness adequately. A significant number of content validity studies involving patients (44%) were cross-cultural adaptations that included a pre-test of the translated instruments (FES-10, mFES-13, mFES-14, ABC-6, ABC-16) with the largest number of studies on ABC-16 (60%). These studies were of doubtful (47%), inadequate (13%) or indeterminate (40%) quality.

Out of the 13 content validity studies involving professionals, 10 were cross-cultural adaptation studies. Two studies on the original instruments explored the relevance of the FES-10 and the comprehensiveness of the Icon-FES but both were of doubtful quality (7, 13). All studies that had included cross-cultural adaptation research involving 6 instruments (FES-10, mFES-13, mFES-14, ABC-15, ABC-16, icon-FES), were of doubtful or indeterminate quality.

Evidence synthesis for falls efficacy scales

Among all instruments evaluating falls efficacy, mFES-13 had high quality evidence demonstrating sufficient results for relevance (based on one adequate quality study and reviewers’ rating) (30), insufficient results for comprehensiveness (based on one adequate quality study and reviewers’ rating) (30). Moderate quality evidence was only available for FES-10 which had sufficient results for relevance (based on one doubtful quality study), mFES-13 which had inconsistent results for comprehensibility (based on one adequate quality study and one doubtful quality study) and mFES-14 which had sufficient results for comprehensibility (based on two doubtful quality studies) (30-33). For all other related instruments measuring falls efficacy, evidence quality had been generally low to very low (see Additional file 7). There had been no relevant studies of content validity studies and related
studies were of inadequate quality based on reviewers’ ratings.

Evidence synthesis for balance confidence scales

Among all instruments evaluating balance confidence, moderate quality evidence was only available for the ABC-15. It displayed sufficient results for relevance (based on one content validity study of doubtful quality) (34). However, insufficient results for comprehensiveness and sufficient results for comprehensibility were supported by very low quality evidence. Similarly, for instruments measuring balance confidence, evidence quality had been generally low to very low (see Additional file 7). There had been no relevant studies of content validity studies and based on reviewers’ ratings, even related studies had shown inadequate quality.

Evidence synthesis for scales with titles relating to falls efficacy

Three scales with titles relating to falls efficacy, Icon-FES, FES-I and MES were developed to measure fear of falling or concerns about falling (12, 13, 35). The Icon-FES was the only scale to have been underpinned by moderate-quality evidence to display sufficient results for relevance and comprehensiveness (based on one doubtful quality study) (13). Other assessments for Icon-FES, FES-I and MES were rated as low to very low by reviewers given the absence of quality within any relevant studies of content validity.

Structural validity

Quality and results of studies

A total of 14 studies (see Additional file 6) assessed structural validity of falls-related self-efficacy (4 studies) (4, 9, 33), balance confidence (8 studies) (34, 36-41) and falls efficacy related titled scales (2 studies) (12, 13). Most authors used exploratory factor analysis (EFA, 72%) (4, 9, 12, 33, 36, 37, 40-42). The remainder used IRT Rasch model (7%) (38), IRT polytomous model (7%) (34) or more than a method of analysis (14%) (13, 39). Most of the studies (93% were of at least adequate quality (69%, high quality and 31%, adequate quality). Only one study was of inadequate quality because an
insufficient sample size had been included for analysis (37).

**Evidence synthesis**

All studies on FES-10, mFES-14, ABC-6, ABC-15, ABC-16, Icon-FES, FES-I and PAPMFR reported positive results, providing high-quality evidence of sufficient unidimensionality. All the other instruments displayed indeterminate ratings.

**Discussion**

**Development and content validity of falls efficacy related scales**

Our synthesized findings from the published literature showed a lack of high quality evidence for falls efficacy-related scales. Of 11 scales specifically measuring falls efficacy and its relevance, only the mFES-13 demonstrated high quality evidence. However, mFES-13 also showed insufficient comprehensiveness and inconsistent results of comprehensibility supported by high and by moderate quality evidence, respectively. The FES-10 and mFES-14 were supported by moderate quality of evidence for both sufficient relevance and comprehensibility. By contrast, both scales had very low quality evidence supporting their comprehensiveness.

For scales measuring balance confidence, only the ABC-15 had sufficient relevance supported by moderate quality evidence, with very low quality evidence supporting both its insufficient comprehensiveness and sufficient comprehensibility. Furthermore, evidential quality for the content validity of the remaining 14 instruments was low to very low. As such, this review demonstrated that current evidence is inadequate to recommend any existing instruments to measure balance confidence.

Furthermore, none of the 15 scales designed to assess either balance confidence or falls efficacy offered sufficient quality or consistency of evidence for content validity to support their unreserved use in community-dwelling older adults. Despite their routine contemporary use, only four scales (mFES-13, FES-10, mFES-14 and ABC-15) had, in fact, been underpinned, even partially, by relevant evidence.

Instruments with titles relating to falls efficacy but measuring other constructs such as fear of falling
(FES-I, Icon-FES and MES) have been categorized separately. Icon-FES showed sufficient relevance and comprehensiveness but with only moderate-quality evidential support. Further concurrent research amongst scales of fear of falling would reconcile selection preferences.

**Structural validity**

Eight instruments (FES-10, mFES-14, ABC-6, ABC-15, ABC-16, Icon-FES, FES-I and PAPMFR) demonstrated sufficient unidimensionality relating to either falls efficacy or balance confidence, with support from high quality evidence.

Nevertheless, unidimensionality might not guarantee that the construct of interest is measured adequately or that no important concepts are being missed, which has been a fundamental concern and emphasizing the pivotal role of content validity within psychometric analyses (28). Failures in adopting proper methodologies within instrument development including during concept elicitation or compromised cognitive interviewing in a target population, may lead to confusion in selecting instruments.

Our evaluation of the instruments’ content identifies that the conceptual framework defining the constructs of falls efficacy and balance confidence differs amongst instruments and should not be interpreted uniformly. The 11 instruments measuring falls efficacy revealed content containing four domains of self-efficacy addressing the potential for falling. The four domains may be expressed in a continuum of situational-specific phases of pre-fall, near-fall, fall-landing and a completed fall (Figure 2). Balance efficacy (or balance confidence) and balance recovery in pre-fall and near-fall phases, respectively, are defined as the perceived abilities to undertake activities of daily living without losing balance and to execute balance recovery manoeuvres to prevent falling. Similarly, efficacy in fall-landing, post-fall and completed fall phases, reflect abilities to fall safely, to get (helped) up and to accomplish actions after falling, respectively. This knowledge acquired through appropriate self-reported instruments will help researchers and clinicians work with community-dwelling older adults to reconcile their perceived abilities and their actual abilities assessed and trained through outcome-based emerging rehabilitation work i.e. perturbation-based balance training and safe falling
techniques training programs (43, 44). While there is no all-purpose measure of perceived self-efficacy to adequately reflect a range of circumstances surrounding falling, different measures might facilitate greater understanding of the abilities of community-dwelling older adults to manage both falling and personal efficacy effectively.

**Limitations of the study**

This review limited its scope to exclude instruments with titles relating to and measuring constructs such as ‘fear’, ‘anxiety’ and ‘activity avoidance’. We were persuaded of the latter constructs distinctiveness compared to the review's focus and an unrealistic expectation that high-quality evidence about falls efficacy and balance confidence could be derived from them. Furthermore, a language limitation amongst the review team hindered its ability to translate, review and rate precisely the quality of evidence of four articles on ABC-16 written in German, Dutch, and Persian. Similarly, rating of evidence qualities amongst the review's articles may have been hampered inadvertently by the review team not having contacted the respective study authors to seek clarification about their published descriptions of study designs (e.g. interview methodologies).

**Conclusion**

This is the first systematic review to apply the COSMIN methodology to thoroughly assess the content validity of a set of falls efficacy related instruments in the community-dwelling older adults. This review highlighted the importance of future research on instruments measuring falls efficacy, focusing on broader concept elicitation. Cognitive interviews involving target populations such as community-dwelling older adults and concomitant research into content validation amongst target populations and professionals from all relevant disciplines will strengthen the evidence for recommending appropriate instruments to measure the intended construct.

**Abbreviations**

FES
Falls Efficacy Scale
mFES
modified Falls Efficacy Scale
ABC
Activities-specific balance confidence scale
CONFBal
CONFBal scale of balance confidence
FES-I
Falls Efficacy Scale-International
Icon FES
Iconographical Falls Efficacy Scale
SAFE
The Survey of Activities and Fear of Falling in the Elderly
UICFFM
The University of Illinois at Chicago Fear of Falling Measure
GFFM
Geriatric fear of falling measure
PAPMFR
Perceived Ability to Prevent and Manage Fall Risk
COSMIN
Consensus-based Standards for the Selection of Health Measurement Instruments
PRISMA
Preferred Reporting Items of Systematic Reviews and Meta-Analyses Protocol
GES
Gait efficacy scale
EFA
Exploratory factor analysis
IRT
Item response theory
MES
mobility efficacy scale
Declarations
Ethics approval and consent to participate
Not applicable

Consent for publication
Not applicable
Availability of data and materials
All data generated or analysed during this study are included in this published article [and its supplementary information files].

Competing interests
The authors declare that they have no competing interests in this section

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Authors' contributions
SS conceived and designed the study, wrote the review protocol, reviewed articles for inclusion, performed a critical appraisal of the included articles, carried out the data extraction, and drafted the manuscript under supervision of JL, CW and NG. JL, CW and TX performed a critical appraisal of the included articles as the second independent paired reviewer and verified the accuracy of the extracted data. NG contributed to the presentation of the data and performed critical revision of the manuscript. All people contributed to the work have been listed.

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Authors' information
SS is currently a PhD candidate at Queen Margaret University. This work forms part of his PhD studies.

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Additional File Information
Additional Files includes:

File name: Additional file 1
File format: AF1.doc
Title of data: Search Strategy
Description: A table detailing the search terms used in the five databases

File name: Additional file 2
File format: AF2.doc
Title of data: Criteria guide to rate studies on structural validity
Description: A criteria guide published by Prinsen and colleagues (2018) which was used to rate
studies on structural validity

File name: Additional file 3
File format: AF3.doc
Title of data: Characteristics and quality assessment of the studies on the development of the included instruments
Description: A table detailing information about the included instruments and the quality rating of the concept elicitation done for instrument development.

File name: Additional file 4
File format: AF4.doc
Title of data: Characteristics, quality assessment and results of the content validity studies
Description: A table detailing information about content validity studies involving target population

File name: Additional file 5
File format: AF5.doc
Title of data: Characteristics, quality assessment and results of the content validity studies involving professionals
Description: A table detailing information about the content validity studies involving professionals

File name: Additional file 6
File format: AF6.doc
Title of data: Characteristics, quality assessment, and results of the structural validity studies of instruments measuring falls-related self-efficacy or balance confidence in community-dwelling older adults
Description: A table detailing information about the structural validity studies of instruments measuring falls-related self-efficacy or balance confidence in community-dwelling older adults
Title of data: Evidence synthesis on the content and structural validity of instruments measuring falls-related self-efficacy or balance confidence in community-dwelling older adults
Description: A table detailing the synthesis of evidence on the content validity and structural validity of falls-related self-efficacy instruments or balance confidence instruments for the community-dwelling older adults

Title of data: PRISMA 2009 Checklist
Description: A completed PRISMA checklist

Table

**Table 1 Instruments measuring falls-related self-efficacy or balance confidence**
| Instrument (Abbreviation)                                | Recall period | Number of items | Response options | Total score range | Interpretation of results |
|--------------------------------------------------------|---------------|-----------------|-------------------|-------------------|---------------------------|
| List of falls efficacy scales                          |               |                 |                   |                   |                           |
| Falls efficacy scale - 10 items (FES-10)               | Undefined     | 10              | 1-10              | 10-100            | Higher score in lower efficacy |
| Modified falls-efficacy scale - 11 items (mFES-11)     | Undefined     | 11              | 1-3               | 11-33             | Higher score in higher efficacy |
| Modified falls efficacy scale - 12 items (mFES-12)     | Undefined     | 12              | 1-4               | 12-48             | Higher score in higher efficacy |
| Modified falls efficacy scale - 13 items (mFES-13)     | Undefined     | 13              | 0-10              | 0-130             | Higher score in higher efficacy |
| Modified falls efficacy scale - 14 items (mFES-14)     | Undefined     | 14              | 0-10              | 0-140             | Higher score in higher efficacy |
| Perceived ability to prevent and manage fall risks (PAPMFR) | Undefined   | 6               | 1-5               | 6-30              | *Items scores were reversed-coded to represent higher scores indicate higher efficacy. |
| Revised gait efficacy scale - 8 items (GES-8)          | Undefined     | 8               | 1-10              | 8-80              | Higher score in higher efficacy |
| Gait efficacy scale - 10 items (GES-10)                | Undefined     | 10              | 1-10              | 10-100            | Higher score in higher efficacy |
| Perceived control over falling (PCOF)                  | Undefined     | 4               | 1-4               | 4-16              | Higher score in higher efficacy |
| Perceived ability to manage risk of falls or actual falls (PAMF) | Undefined | 5               | 1-4               | 5-20              | Higher score in higher efficacy |
| Balance Self-Perceptions Test (BSPT)                   | Undefined     | 20              | 1-5               | 20-100            | Higher score in higher efficacy |
| List of balance confidence scales                      |               |                 |                   |                   |                           |
| Activities specific balance confidence scale - Short (ABC-6) | Undefined | 6               | 0-100             | 0-600             | Higher score in higher efficacy |
| Activities specific balance confidence scale - Simplified (ABC-15) | Undefined | 15              | 0-3               | 0-45              | Higher score in higher efficacy |
| Activities specific balance confidence scale (ABC-16)  | Undefined     | 16              | 0-100             | 0-1600            | Higher score in higher efficacy |
| CONFBal scale of balance confidence (CONFBal)          | Undefined     | 10              | 1-3               | 10-30             | Higher score in lower efficacy |
| List of scales not measuring falls efficacy or balance confidence |            |                 |                   |                   |                           |
| Iconographical Falls Efficacy Scale (Icon-FES)         | Undefined     | 30              | 1-4               | 30-120            | Higher score in greater concern falling |
| Falls efficacy scale - International (FES-I)           | Undefined     | 16              | 1-4               | 16-64             | Higher score in greater concern falling |
| Mobility efficacy scale (MES)                          | Undefined     | 10              | 1-4               | 10-40             | Higher score in greater concern falling |

Figures
Figure 1

Flow chart of results of search strategy and selection of records
Supplementary Files
This is a list of supplementary files associated with this preprint. Click to download.
AF3.docx
AF4.docx
AF5.docx
AF6.docx
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