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Research Article

Development and Utility of an International Classification of Functioning, Disability and Health Code Set for Younger-Old Adults With Fall Risk: Implications for Audiologists

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ABSTRACT

Purpose: Falling is a multifactorial condition that can cause severe injury and even death in older adults. Early identification of fall risk factors, as the first step of preventive health care, can assist in reducing the negative and often debilitating effects of falls in older adults. By using the World Health Organization's International Classification of Functioning, Disability and Health (ICF) framework to develop an ICF code set to identify fall risk factors in older adults, health care practitioners could obtain health information in a multidimensional way.
Method: This study describes the final phase of a comprehensive, three-phase, mixed-methods sequential study. For this third phase, a pre–post group design that focused on the audiologist's perceptions of the clinical utility of a newly developed ICF code set was employed. The questionnaire that was used for this purpose consisted of two distinct sections: clinical application and clinical utility (viz., appropriateness, accessibility, practicability, acceptability, and professional utility). Thirty practicing audiologists participated in the study. Data were analyzed for each of the two sections of the questionnaire.
Results: Results related to clinical application indicated that regardless of the audiologists' experience in routine fall risk assessment or fall risk factor identification, the use of the developed ICF code set increased their ability to correctly identify relevant clinical aspects. Results related to clinical utility showed high scores across all five measure components, with the highest clinical utility component being acceptability, closely followed by appropriateness and professional utility, and the lowest being accessibility.
Conclusion: Several clinical implications have emerged from this study, including the usefulness of the ICF code set to identify and document fall risk factors in older adults, the code set's ability to guide audiologists to determine individualized assessment needs either by themselves or by other health care disciplines, and that the code set could be used by audiologists regardless of their experience in vestibular assessments.

Falling is the second leading cause of deaths related to accidental injury worldwide (World Health Organization [WHO], 2018). It is estimated that a third of community-dwelling older people all over the world may experience fall accidents annually (Hung et al., 2017). A recent review of falls in older adults in the United States indicated that deaths from falls increased from 8,600 deaths in 2000 to more than 25,000 deaths in 2016 (Hartholt, 2019). The WHO warns that the number of injuries in older adults caused by falls could double by the year 2030 unless fall prevention programs that have a positive short-term effect on fall risk are employed (Park, 2017).

As populations all over the world age, older adults are increasingly being subdivided into different age groups, that is, younger-old (65–74 years old), middle-old (75–84 years old), and older-old (85 years and older; Lee

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et al., 2018). It is imperative that preventive health care systems adapt to reduce the incidence and severity of preventable conditions such as falling, which is contingent on accurately identifying fall risk factors. Early fall risk factor identification, as the first step in preventive health care, can assist in reducing the negative and potential debilitating effects of falls in this age group (Liddle et al., 2018; Patterson & Honaker, 2014), such as trauma, broken bones, and complications after sedation (Dionyssiotis, 2012). Identifying risk as early as possible is an area warranting more research, as an early fall risk management perspective has the potential to yield a noticeable benefit to and positive impact on this population. As such, audiologists have an important role to fulfill in the reduction of falls in older adults, as they regularly consult with them, and can integrate fall risk factor identification into their daily clinical assessment routine. Furthermore, it is important to specify the age group that is focused on when developing fall risk tools, as this could influence the results obtained. Younger-old adults would most likely have different needs and risk factors when compared with older-old individuals.

Fall risk factors in this population are most commonly classified as being either intrinsic (i.e., biological) or extrinsic (i.e., behavioral, social, and/or environmental; Kwan et al., 2016). Intrinsic fall risk factors include, but are not limited to, age, health status, race, sex, cognitive deficits, gait, strength or balance deficits, chronic conditions, acute illnesses causing hospitalization, and prior fall history (Ambrose et al., 2013; Fisher et al., 2005; Gale et al., 2016; Kenny et al., 2016; Ma et al., 2014; Nicklett & Taylor, 2014; Phelan et al., 2015; Van Doorn et al., 2003; Yonge et al., 2016).

Extrinsic fall risk factors, on the other hand, refer to environmental and domestic hazards. Examples include medication; alcohol or drug intake; footwear; home features; and environmental circumstances such as poor lighting, slippery floors, and cluttered pathways (Fisher et al., 2005; Kelsey et al., 2010; LeCuyer et al., 2016; Phelan et al., 2015). Simply identifying both the intrinsic and extrinsic fall risk factors can be regarded as an effective starting point in identifying and describing factors that could increase older adults' risk of falling. A more comprehensive way of identifying and describing fall risk factors in older adults, however, is to consider the fall risk factors in a multidimensional, holistic way, where factors related to the older adults themselves as well as those related to the individual's specific environment should both be considered. As many fall risk factors are modifiable, audiologists can employ preventive health care to reduce older adults' fall risk by reducing or minimizing the potential fall risk factors applicable to each individual (Pillay et al., 2021).

Identifying the factors that are relevant to—and, subsequently, those that are critical for—older adults is important when considering a preventive perspective on fall risk factor identification. A prevention agenda would best be served by focusing on the younger-old group, as they are likely the most active group of older adults who have an increased opportunity to fall while engaging in several activities (e.g., sports and leisure activities). Early identification of fall risk factors, preferably before the first fall, and followed by timely intervention and management strategies could reduce these older adults' fall risk and keep them active for as long as possible, thereby improving their health-related quality of life (HRQoL).

One framework that could be used to improve HRQoL by identifying fall risk factors in older adults is the WHO's (2001) International Classification of Functioning, Disability and Health (ICF). Built on a multidimensional view, the ICF is especially suitable to obtain health information because it assists audiologists to recognize the individual (i.e., a body participating in specific activities) as being influenced by different contextual factors. The ICF acknowledges that body functions and structures (commonly referred to as intrinsic factors) as well as factors outside the person and objects in the environment (commonly referred to as extrinsic factors) can influence the individual by either facilitating or hindering participation in daily activities. Both the intrinsic and extrinsic factors are therefore recognized as important and highly influential features for functioning, disability, and health (Granberg, 2015; Granberg et al., 2014), and both have an influence on the older adult's risk of falling.

The ICF framework provides a holistic view of functioning and allows for a detailed description of each of the components related to the functioning of a person with a specific condition within a specific population, such as hearing loss (Granberg, 2015; Granberg et al., 2014), aphasia (Pettit, 2014), and traumatic brain injury (Aiachini et al., 2010). Its comprehensive nature obviously requires the ICF to have a large number of codes —1,424 codes in total. Extensive experience of and familiarity with its classification system and codes are needed before the ICF can be used effectively in clinical practice (Granberg et al., 2014). Furthermore, to aid clinical use, practitioners and researchers have suggested that certain codes can be grouped together to form an ICF code set. For instance, a list of ICF codes can be taken from the entire overwhelming classification system to describe the functioning applicable only to individuals with a specific health status, such as fall risk, or individuals who share a particular characteristic (e.g., age; Aiachini et al., 2010). An ICF code set that contains only the factors critical to the identification of fall risk in older adults could thus assist health care practitioners (HCPs) in overcoming some of the challenges in the clinical application of the ICF. Although this article focuses on the use of an ICF code set for fall risk factors by audiologists, the code set

could also guide the preventive strategies of HCPs from different disciplines.

Several fall risk assessment tools (FRATs) exist, some of which are based on the ICF. Three ICF code sets that relate to fall risk and/or older adults are currently available. An ICF core set for fall risk in an acute rehabilitation setting that was derived in the past decade (Yen et al., 2014) focuses on the risk factors related to older adults in acute inpatient rehabilitation departments in hospitals. This core set does not consider the risk factors related to community-dwelling older adults who are not currently hospitalized. Moreover, it was developed primarily for HCPs based in an acute rehabilitation setting (e.g., nurses, emergency room doctors; Yen et al., 2014) and is therefore not necessarily applicable to HCPs from different disciplinary backgrounds (e.g., HCPs not directly involved in acute rehabilitation settings). The focus of preventive health care is on the early identification of risk factors, preferably prior to the first fall, which could result in hospitalization.

Furthermore, a comprehensive geriatric ICF core set was developed to reflect the most relevant health-related problems among community-living older adults without dementia. Mobility was identified as one of the most prominent problems in this population (Spoorenberg et al., 2015). The geriatric ICF core set considers several health conditions and related problems in older adults and does not focus specifically on a single health aspect, such as falls and fall risks. Similarly, an initial core set for community-dwelling adults aged 75 years and above (i.e., the middle-old group) has been derived to identify all the health factors relevant to this population. This core set has a broad focus, and although it includes falls, it does not focus specifically on falls or fall risks (Tomandl et al., 2018).

By itself, none of these ICF code sets could be accurately used to identify fall risk in community-dwelling older adults, as none of them could be used by HCPs from different disciplines to identify the relevant fall risk factors in this population as part of preventive health care. An ICF code set to identify fall risk factors in older adults was developed as part of a comprehensive, three-phase, mixed-methods sequential research project spanning 5 years (see Table 1). Phase 1 includes code set sampling and item compilation gathered from literature perspective (via a systematic review), a target population perspective (via focus groups with older adults), and a clinical perspective (via focus groups with HCPs). Phase 2 includes code set item evaluation and reduction utilizing a modified Delphi process. This phase had two goals: (a) to condense the number of codes from the relevant list of ICF codes compiled in Phase 1 by using a formal consensus exercise, based on expert opinion, as a structured communication method in the form of a Delphi process (Habibi et al., 2014) and (b) to determine the standard minimum list of ICF codes that are critical to the identification of fall risk factors in older adults and of potential clinical value. On the completion of Phase 2, the ICF code set consisted of a total of 49 codes and three personal factors. Phase 3 includes code set administration among different HCPs, including audiologists.

This study focuses only on the final phase, that is, Phase 3: code set administration. The primary aim of this article was to describe audiologists' clinical application of

Table 1. Research study overview.

Qualitative Phase 1: Code set sampling and item compilation			
Research methodology, results, and discussion			
Study main aim and sub-aims for the phase			
Research design			
Ethical considerations			
3.1 Literature perspective: systematic review (de Clercq et al., 2021a)	3.2 Target population perspective: focus groups with older adults (de Clercq et al., 2021b)	3.3. Clinical perspective: focus groups with health care practitioners (de Clercq et al., 2020)	3.4 Merging of the ICF codes
Quantitative Phase 2: Code set item evaluation and reduction			
Research methodology, results, and discussion			
Study main aim and sub-aims for the phase			
Research design			
Ethical considerations			
Pilot study			
Modified three-round Delphi process			
Quantitative Phase 3: Code set administration			
Research methodology, results, and discussion			
Study main aim and sub-aims for the phase			
Research design			
Ethical considerations			
Pilot study			
Main quantitative study			

Note. ICF = International Classification of Functioning, Disability and Health.

the newly developed ICF code set, specifically to determine (a) the clinical usefulness of the ICF code set by comparing audiologists' responses to a questionnaire when they have access to the ICF code set versus those when they have no access and (b) audiologists' perceptions regarding the clinical utility of the ICF code set after applying it to a written case study in terms of the code set's appropriateness, accessibility, practicability, acceptability, and professional utility.

Method

Research Design

As described, this study is the final phase of a larger, three-phase study and deals with the administration of the newly developed code set. The focus was not on the participants' clinical knowledge but on the clinical utility of the code set. However, the latter could not be established unless the participants had some experience of using the ICF code set with a "real client" (in this case, by means of a written case study). Therefore, clinical application of the code set was needed before its clinical utility could be determined.

The study commenced with a pre–post group design (Parmin et al., 2016), which focused on the clinical application of the code set, using a questionnaire (see the Appendix) with two distinct sections: clinical application and clinical utility. Participants were requested to first read a written case study and then to complete the clinical application section of the questionnaire (pre–code set: O_1). Next, they were provided with the ICF code set (the independent variable X) and asked to re-answer the same clinical application section of the questionnaire (post–code set: O_1). The clinical utility section of the questionnaire (O_2) was only answered once—after they had used the ICF code set.

The design can be visually represented as follows:

Clinical application section: O_1 (pre–code set)... X (independent variable)...O_1 (post–code set)
Clinical utility section: . . . . . X (independent variable)....O_2 (post–code set)

Participants

Although the newly developed ICF code set is intended for a range of HCPs, only one group—audiologists—was involved as participants in this study. They were specifically selected because, according to the American Academy of Audiology (2019), audiologists have a critical role to play in fall risk factor identification in older adults. In addition, the selection of audiologists as the targeted HCP group is also a result of the global COVID-19 pandemic. Since audiologists are not considered "frontline workers" in the fight against COVID-19 (Swanepoel, 2020), they were more readily available to participate in the research, despite being allowed to continue consulting with patients. At the time of data collection, South Africa was adhering to strict Level 2 lockdown requirements, and data collection had to be adapted to ensure that it could be done electronically to avoid all unnecessary person-to-person contact. As older adults are considered a vulnerable population to be infected with COVID-19 (Centers for Disease Control and Prevention, 2020), the researcher opted to use a written case study in the data collection process—in lieu of clinical patients—to limit the spread and risk the pandemic.

Participant Sampling and Recruitment

Nonprobability purposive sampling was used to invite potential participants (Leedy & Ormrod, 2014). A three-pronged approach was used for recruitment. Participants were recruited first via the e-mail list of the South African Association of Audiologists (SAAA), consisting of 310 members; second, through the SAAA Facebook page; and third, by means of snowball recruiting. All participants who indicated an interest in the research study as well as the clinical colleagues of the researchers were phoned to request the contact details of their colleagues who would potentially be interested in participating in the research study. By using electronic and/or telephonic methods of recruitment, the researcher was able to contact the audiologists and still adhere to South Africa's lockdown regulations to minimize person-to-person contact. Snowball recruitment proved to be an efficient and cost-effective way to access more participants who might otherwise have been difficult to contact.

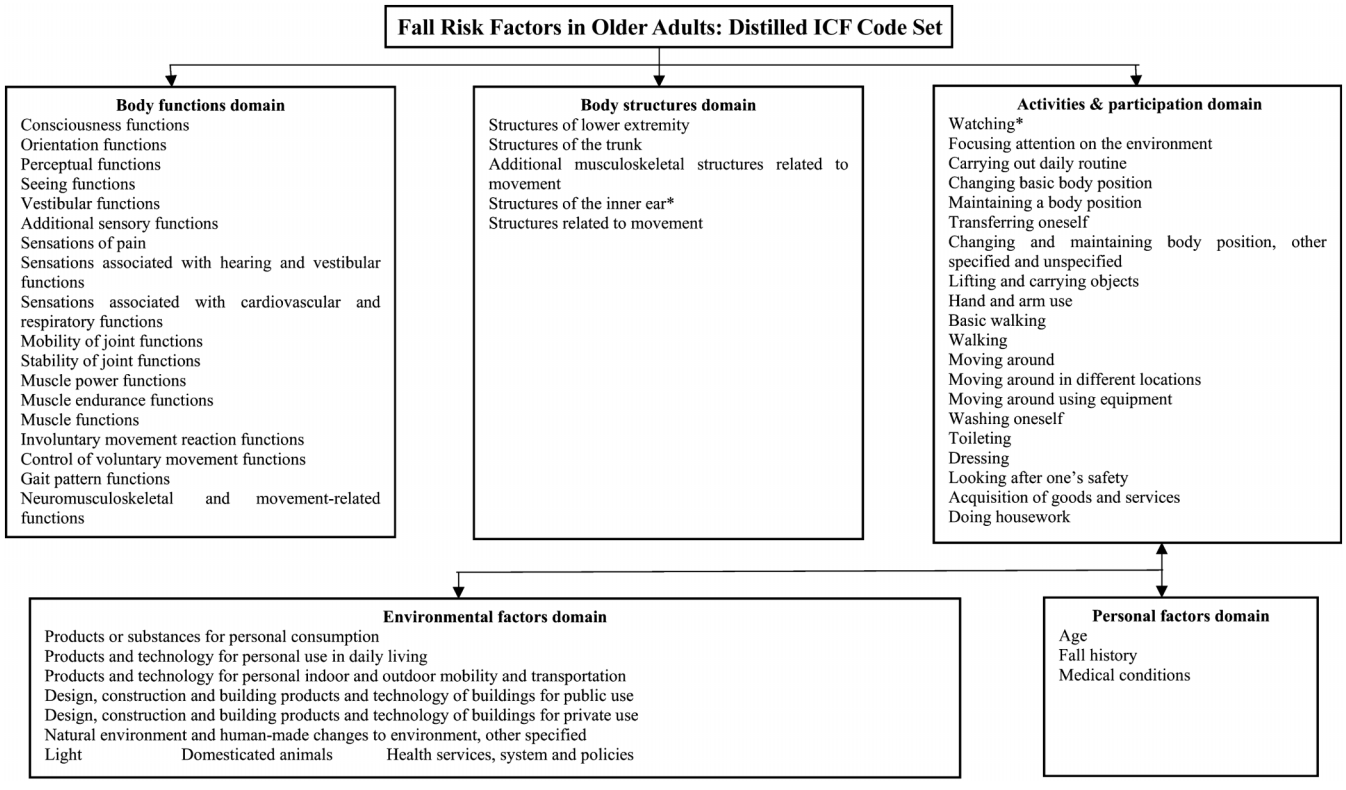
Participants were selected based on three criteria, namely, (a) registration with the Health Professions Council of South Africa (HPCSA), (b) experience as an audiologist, and (c) experience consulting with older adults. A total of 37 participants agreed to participate in the research study, two of whom did not meet the inclusion criteria (one participant did not consult with older adults, and one participant did not state her HPCSA registration or qualification), and hence, their responses were not captured. Five of the remaining 35 participants completed the questionnaire only partially (two participants did not complete the clinical utility section at all, and three participants completed less than 50% of the clinical utility section), and therefore, their responses were also deleted from the data. The remaining 30 participants completed the questionnaire in full, and only their responses were used and analyzed in this study.

Almost two thirds (36%) of the participants held a dual qualification and an HPCSA registration as an audiologist and a speech-language therapist. All five South African universities offering a degree in audiology were represented. The years of practice correlated with the graduation period, showing that a third (30%) had 20 years or more of experience practicing as an audiologist, the second third (3%) had 10 years or less of experience, and the last third (37%) had 11–20 years of experience. All the participants regularly consulted with older adults in their practices, with almost two thirds of the participants (60%) consulting with six to 15 older adults on average per week. Six participants (20%) indicated that they perform fall risk screening or use fall risk tools. Of the 24 participants (80%) who did not use fall risk tools in their practice, the overwhelming majority (75%) listed no prior training as the main reason. They also indicated that they did not conduct vestibular assessments in their practice, that they did not feel comfortable performing fall risk screenings, and that they did not have the time to conduct fall risk assessments during routine consultations. Most of the participants (70%) indicated that they either do not know what the ICF is or have only heard about it before. Of the four participants who were using the ICF in their practice, three had more than 16 years of experience as an audiologist, and all four of them graduated from the University of the Witwatersrand. A high percentage of participants requested more information on fall risk screening as well as the use of the ICF in clinical practice.

Materials and Equipment

Four different materials were used during this study, namely, (a) informed consent letter; (b) questionnaire, consisting of two sections—clinical application and clinical utility (see the Appendix); (c) written case history; and (d) ICF code set (see Figure 1). All material were pilot tested prior to the commencement of the main data collection. The aim of the pilot study was to pretest the questionnaire, the written case history, and the developed ICF code set in order to detect and remediate any deficiencies (ambiguous instructions, inadequate time limits, etc.) prior to the main study. Four participants were purposively selected and recruited for the pilot study. The same participant criteria as proposed for the main study were applied, and experience in vestibular assessment was used to stratify the participants. It also ensured that audiologists across the spectrum of vestibular experience would be able to engage with the questions and that the questionnaire was not over- or under-simplified. The participants suggested no changes to the methodological aspects of the questionnaire but several changes to the feasibility of the

Figure 1. Final International Classification of Functioning, Disability and Health (ICF) code set presented according to the ICF framework.



questionnaire (to both the clinical application section and the clinical utility section), the written case history, and the ICF code set.

The clinical application section of the questionnaire consisted of three objectives, namely, (a) identifying factors (barriers and facilitators) that could increase fall risk in older adults, (b) determining fall risk factors that would justify assessment by the audiologist, and (c) determining areas in which further assessment and/or intervention might be warranted (since this fell outside the audiologist's scope of practice, referral to other HCPs was required). On the basis of the written case history provided, the participants had to answer four clinical application questions first without the use of the ICF code set and then again with the use of the ICF code set.

Literature provides scant information regarding the quantitative measurement of clinical utility, especially when not testing a specific drug or medical procedure. This challenge was addressed by adapting and expanding the works of Smart (2006) and Lesko et al. (2010) to construct a usable definition and quantitative measure of clinical utility. The four components of clinical utility suggested by Smart—appropriateness, accessibility, practicability, and acceptability—were adapted to suit this study, specifically by including an operational definition for each component. Moreover, it was expanded by adding a fifth component—professional utility—as introduced by Lesko et al. (see Table 2).

The written case study was a direct result of the global COVID-19 pandemic restrictions as mentioned earlier, which prohibited "real-life patients" from participating in the research. The written case history consisted of a generic case history of an older adult, based on the Ida Institute's case history form (obtained from http://www.idainstitute.com). This case history was aligned to the broader aim of the ICF code set as it was intended for use by all audiologists (not only those who specialize in vestibular cases) to identify fall risk factors in all older adults.

Data Collection Procedure

Data were collected electronically. An e-mail containing information on the research study as well as the link to the questionnaire was sent to the 310 SAAA members on their database, as well as to the 25 participants identified by means of snowball recruitment, as part of the informed consent procedure. Only one e-mail was sent so as to adhere to the ethics permission conditions and to reduce the number of e-mails sent to potential participants.

Subsequently, the link to the questionnaire was sent to all participants who agreed to participate in the study. The questionnaire was designed in such a way that one could not proceed to any of the later sections (biographic, clinical application, or clinical utility sections) without first completing the informed consent section. The deadline for submission of questionnaires was set for 3 weeks from the beginning of the data collection process.

Data Analysis Procedure

Data were analyzed separately for the two sections of the questionnaire. For the clinical application section, the aim was merely to determine if the use of the code set increased the number of preferred answers for four clinical questions, not to test the audiologists' clinical knowledge. In order to perform statistical inference, a one-sided hypothesis was used as an alternative hypothesis for this first aim.

H0: Per question (each presenting a separate category), there is no difference between the number of answers provided across the group before receiving the ICF code set and that after having been provided the code set.

H1: Per question (each representing a separate category), more preferred responses are provided after receiving the ICF code set than before receiving the code set. This hypothesis implied that the percentage of preferred responses after receiving the ICF code set would be higher than that before receiving the ICF code set.

The paired t test was used to compare the means of the code set scores of the participants for the four questions related to the written case study before and after using the ICF code set. The aim was to determine whether the differences between the means were statistically significant or not (Rietveld & van Hout, 2017).

For the clinical utility section, the results were analyzed based on the number of questions each participant scored as their preferred response. No assumptions were made regarding the form of the sample population or the values of the distribution, and as such, nonparametric statistics were used to test the significance of the finding. The Kruskal–Wallis test was used as a one-way analysis of variance, and the Bonferroni correction method was applied to adjust the p values (Jafari & Ansari-Pour, 2019). Fisher's exact test was employed as a statistical significance test used in the analysis of contingency tables for small samples (Kim, 2017).

Results

Results are presented in accordance with the two aims of the study.

Clinical Application Results

The main aim of this section is to compare the audiologists' answers pre–code set and post–code set in order to determine if the use of the ICF code set increased the

Table 2. Clinical utility components, operational definitions, and aspects measured.

Clinical utility component	Operational definition	Aspects measured
Appropriateness: effectiveness and relevance	*Effectiveness* refers to the clinical indicators of the measure, such as the ability to identify fall risk factors; the use of the measure in clinical practice settings; the application of the measure during the consultation process; compatibility with other clinical measures; and the beneficial outcomes of using the measure for patients, such as referring to other practitioners and potentially improving patients' HRQoL (NHS Foundation Trust, 2018).	***Effectiveness*** • Ability to identify fall risk factors • Use of the measure in clinical practice settings • Applying the measure during the consultation process • Compatibility with other clinical measures • Referring to other relevant HCPs
	Relevance refers to the consequential or meaningful information provided to the audiologists when using the ICF code in clinical practice.	***Relevance*** • Discussing fall risk factors that could potentially improve HRQoL • Consequential information (meaningfulness)
Accessibility: financial considerations	*Financial considerations* refer to the cost of using the ICF code set in clinical practice and the reimbursement by the patient (or by their medical aid) for using the code set during consultations.	***Financial considerations***: • Cost implications • Reimbursement
Practicability: functionality, suitability, and training	*Functionality* relates to whether the ICF code set meets its goal of identifying fall risk factors in older adults, as well as the practicability of the ICF code set in terms of its intuitiveness and the audiologist's ability to obtain the code set.	***Functionality*** • Meeting its goal of identifying fall risk factors • Intuitiveness of using the measure • Obtaining the ICF code set
	Suitability refers to the audiologist's perceived fit of using the code set in clinical practice.	***Suitability*** • Perceived fit of the ICF code set • Ease of use in clinical practice
	Training refers to the amount of training needed for audiologists to use this ICF code set, and their ability to easily use the code set in clinical practice.	***Training:*** • Additional training needed
Acceptability: ethical considerations	*Ethical considerations* include the audiologists' sensitivity to potential ethical concerns in using the ICF code set in their scope of practice.	***Ethical considerations:*** • Autonomy • Non-maleficence • Beneficence • Justice
Professional utility: perceived benefit and value	*Perceived benefit and value* refer to the perceived value for the audiologist as an HCP when using this code set in a clinical setting, as well as the benefit for their patients.	***Perceived benefit*** • Perceived benefit of using the ICF code set for patients • Perceived benefit of using the ICF code set for audiologists ***Value*** • Value of the ICF code set for intervention strategies

Note. HRQoL = health-related quality of life; HCP(s) = health care practitioner(s); ICF = International Classification of Functioning, Disability and Health.

number of preferred answers for each question. For each of the four clinical application questions, the range and mean scores were determined as well as the number of preferred answers per question (see the summary in Table 2).

The results indicated that the mean scores for each question increased, resulting in an overall increase (gain) in preferred responses given by the participants when using the ICF code set. However, due to the small number of participants, the mean scores obtained were not necessarily an accurate reflection of the results. In fact, they should be interpreted in conjunction with the overall scores obtained by the participants, which indicated an increase in the scores for all but one question.

The total number of preferred answers showed a gain of 5.75% when the participants used the ICF code set to answer the clinical application section. Since the same group of participants and the same set of questions were used, the gain was recorded as a percentage score per question to determine if the number of preferred responses increased or decreased for each question when using the code set. The biggest increase was seen in Questions 1 and 4, with the smallest increase in Question 3 and a minimal decrease in correct answers in Question 2. The latter was the direct result of only one participant whose score decreased.

Twenty-three (76.67%) of the participants' scores remained the same pre–code set and post–code set, with

six participants' scores increasing post–code set. As alluded to earlier, only one participant's score decreased post–code set. Two participants obtained the maximum total score pre–code set and post–code set (Participants 1 and 20), with five participants obtaining a score of 10–16 out of 17 pre–code set (59%–94%) and seven participants obtaining this score post–code set (59%–94%).

A comparison was made to determine significance between the post–code set scores of the six participants with the least experience (1–5 years) and the post–code set scores of the 24 participants with 6 or more years of experience, using Fisher's exact test to determine significance. This resulted in a p value of .7167, indicating no significant association between years of experience and an improvement in the clinical application of the code set.

Next, using the same method, a comparison was made between the participants who routinely assess fall risk and those who do not conduct fall risk assessments. The significance of these groups was determined, and again, no significance between routine assessments of fall risk and an improvement in clinical application scores using the code set were obtained.

Clinical Utility Results

The results indicated that the code set has high clinical utility in all five measure components, with the highest clinical utility component being acceptability, closely followed by appropriateness and professional utility, and the lowest being accessibility. The results for each of the five clinical utility components are illustrated in Figure 2. This resulted in a total score of 87% preferred responses across the five components for clinical utility.

The number of preferred responses for each participant ranged from 72.22% (Participant 24) to 98.15% (Participant 3), with a mean score of 87.28%. None of the participants had a higher score for unpreferred responses. Results indicated that the responses were comparable, and no outliers were observed, with almost half of the participants (n = 14) obtaining a score of 90%, 11 obtaining a score of 81%–89%, and only five participants scoring less than 80% (72%–79%).

The number of preferred responses in each component was calculated using the Kruskal–Wallis test as a one-way analysis of variance to determine statistical significance. The Bonferroni-adjusted p value was calculated ($p < .005$) and compared for significance. The component pairs are compared in Table 3. The number of preferred responses in each component indicated that the components with the highest clinical utility scores were appropriateness, acceptability, and professional utility, and the component that achieved the lowest score overall was accessibility.

Discussion

Considering the fact that significantly more patients seen in audiology practices, compared with those not seen by an audiologist, fall on an annual basis, preventive action on the part of audiologists can have a significant impact in reducing fall risk (Criter & Honaker, 2016). In many countries, equipment for vestibular testing is expensive, reimbursement rates for testing are low, and the many audiologists do not conduct these tests routinely—whether in the private or public sector (Seedat et al., 2018).

The results obtained in this study, together with those in the works of Seedat et al. (2018), Khoza-Shangase et al. (2020), and Lingen (2017), support the notion that training of audiologists in vestibular assessments (including fall risk identification), as well as

Figure 2. Perception of the clinical utility components.

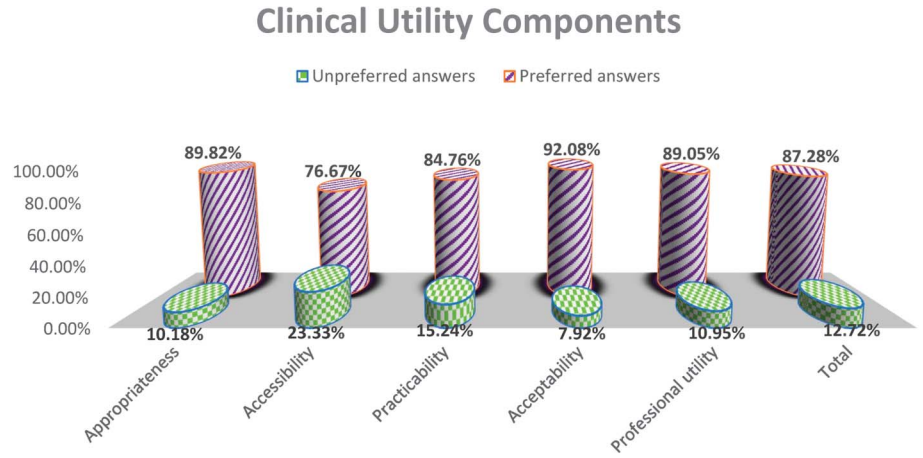


Table 3. Comparison of *p* values for clinical utility component pairs.

Component pair	*p*	Component pair	*p*
Appropriateness vs. accessibility	< .0001**	Accessibility vs. acceptability	< .0001**
Appropriateness vs. practicability	.0188	Accessibility vs. professional utility	.0016*
Appropriateness vs. acceptability	.3598	Practicability vs. acceptability	.0070
Appropriateness vs. professional utility	.7914	Practicability vs. professional utility	.1775
Accessibility vs. practicability	.0196	Acceptability vs. professional utility	.3300

*Statistically significant on the 5% level of confidence: $p < .05$. **Statistically highly significant on the 99% level of confidence: $p < .001$.

encouraging audiologists to conduct fall risk identification in the older adults they consult with in their practice, is needed. The use of the ICF code set could enable audiologists to assist more of the older adults they consult with, either by conducting the assessments themselves or by referring them to other HCPs based on the information obtained from the ICF code set.

When using the ICF code set to guide their clinical decision making, the audiologists were able to correctly identify other HCPs to whom they would refer the patient. Results also indicated that the audiologists were able to correctly identify the fall risk factors that they should be able to assess as part of their scope of practice when using the ICF code set. This highlights the ability of the ICF (and the code set) to focus on the patient in a more holistic manner, as all the critical factors related to a person's functioning are considered and not only those related to their medical condition (WHO, 2002). Despite neither having received training in using the ICF code set nor having extensive clinical experience in using an ICF code set, the results from this study emphasized that audiologists found the ICF code set to be both easy and comprehensive for use in the clinical context.

Clinical utility is of central importance to personalized health care and is the minimum standard of care to ensure a positive outcome for patients. It adds value to the patient's overall HRQoL and ability to seek effective treatment or preventive strategies as needed (Lesko et al., 2010). This ICF code set could be used by audiologists to identify fall risk factors in younger-old adults, guide their further assessment and referral strategies, and so potentially improve their HRQoL. Results indicate that audiologists were willing to use the code set even if it increased the time they spend with each patient. It provided them with a means to discuss the relevant fall risk factors with their patients and educate them on these risk factors. The developed ICF code set was deemed functional and suitable to be used in everyday clinical practice, with minimal training required to effectively use the code set. By using the developed ICF code set, audiologists perceived that they could actively do good and act to the benefit of their patients. Both audiologists and patients could benefit from the use of the code set, as early identification of fall risk factors and the implementation of appropriate intervention strategies could ultimately increase the patients' HRQoL.

Clinical Implications

Several key quantifiable propositions have emerged from this research study. First, this newly available measure in the form of an ICF code set for early identification of fall risk factors in older adults could increase audiologists' situational awareness regarding fall risk factors and appropriate referral strategies. Preventive health care and early identification of fall risk factors in younger-old adults can only be successful as a multidisciplinary approach. Increased awareness of one's own scope of practice can lead to a greater ability to provide preventive health care to older patients with unique needs.

Second, the ICF code set is a useful measure for audiologists to identify and document fall risk factors in younger-old adults in line with the ICF's approach toward health care in the different domains (i.e., body function and body structure, activities and participation, contextual factors). Furthermore, it provides audiologists with the necessary information for early identification of fall risk factors in this population and referral to other HCPs as needed. Hence, they can be actively involved in reducing and even preventing modifiable fall risk factors in this population. Modifiable fall risk factors include poor balance due to neurological gait disorders, mobility problems, polypharmacy, visual impairments, and home/environmental hazards (Stevens & Lee, 2018).

Third, the ICF code set could guide audiologists to determine individualized assessment needs either by themselves or by other health care disciplines. Concerningly, this study found that the majority of the audiologists (especially those who did not conduct any fall risk assessments themselves) did not know to whom they should refer patients who present with vestibular symptoms, including fall risk. This indicates a need for continuing education among audiologists not only on how to identify patients with a fall risk but also on where to refer them based on their case history. By using the ICF code set as the first step in this process, audiologists could identify the

fall risk factors relevant to each patient they consult with, which will inform the necessary action plan including referrals.

Fourth, some of the audiologists believed that special training in vestibular assessment was needed to enable them to conduct assessments for fall risk, vertigo, or dizziness in older adults and to use formal assessment tools such as FRATs. The results of the study indicated that audiologists, regardless of their experience in vestibular assessment, would be able to use the developed ICF code set to identify fall risk factors in older adults. The code set would also enable them to appropriately refer the patients who need additional assessment in areas that fall outside their scope of practice. In conclusion, audiologists who continually add and implement additional tools or measures in their practice (based on current research and best practice guidelines) have the potential to increase their patients' HRQoL by including the latest health care measures in their consultation (Price & Reichert, 2017).

Limitations

This study had some limitations. During Phase 1, data were gathered from three stakeholder groups, namely, the literature, the older adults themselves, and HCPs. However, the perceptions of the significant others and/or family members of older adults with a fall risk were not solicited. It could be argued, however, that this was appropriate, as the target group for which the ICF code set was designed was that of the HCPs who consult with the older adults and not necessarily with their family members.

The second limitation relates to the participants in the final phase, which were limited and may well have been expanded to include audiologists internationally, as the data were collected electronically and the location of the participants was not a selection criterion. A comparison between HCPs in utilizing a questionnaire can be conducted as future research.

Conclusions

The main focus of this research study was the development and utility of an ICF code set that would contain the critical codes to consider when identifying fall risk factors in community-dwelling younger-old adults. The objective, which was to guide audiologists' early identification strategies, was achieved by developing, evaluating, and subsequently administering the ICF code set for fall risk factors in older adults to a group of HCPs, namely, audiologists, to determine its clinical utility. The results of this study indicate that the ICF code set has high clinical utility for audiologists and that audiologists should be able to use the code set as part of their daily consultations with younger-old adults to identify fall risk factors in this population. Having the ability to utilize an ICF code set with young adults could increase audiologist knowledge regarding the patient-specific factors that contribute to fall risk. This could also empower the audiologists without vestibular assessment training to utilize FRATs within their clinical practice. Use of the ICF code set by HCPs in clinical practice can potentially benefit the older adults they consult with and so improve their HRQoL.

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Appendix (p. 1 of 5)

Clinical Utility Section (Conceptualized From Lesko, 2010, and Smart, 2006)

Component aspects	Operational definitions of components	Aspects to measure	Questions (Answer all questions on a 5-point Likert scale: from 1 = *strongly disagree* to 5 = *strongly agree*)
Appropriateness—This component includes questions about a measure being effective and relevant (Smart, 2006)			
Effectiveness	Effectiveness, in a broad sense, refers to the assessment of whether a specific measure/treatment—in a setting as close as possible to typical patient care—does what it was intended to do and whether it has a potentially meaningful impact on the patient's HRQoL (Atkins et al., 2005). In this study, clinical effectiveness refers to the clinical indicators of the measure, such as the ability to identify fall risk factors; the use of the measure in clinical practice settings; the application of the measure during the consultation process; compatibility with other clinical measures; and the beneficial outcomes of using the measure for patients, such as referring to other practitioners and potentially improving patients' HRQoL (NHS Foundation Trust, 2018).	• Ability to identify fall risk factors • Use of the measure in clinical practice settings • Applying the measure during the consultation process • Compatibility with other clinical measures • Referring to other relevant practitioners	1. Using this ICF code set enabled me to identify fall risk factors more easily than without using it. 2. I do not think this ICF code set could assist me to identify fall risk factors in older adults. 3. I would be able to use this ICF code set to identify fall risk factors in older adults prior to the use of further assessment methods. 4. I do not think using this ICF code set would increase the time spent on consulting with older adults. 5. I can see myself implementing the ICF code set in routine daily practice. 6. I would be able to seamlessly integrate this ICF code set in my existing consultations with older adults. 7. I do not think using this ICF code set is something I would routinely use in my consultations with older adults. 8. In my experience, this ICF code set is compatible with existing fall risk assessment tools (e.g., Berg Balance Scale/STRATIFY). 9. I would be able to use this ICF code set as a standard tool to document the fall risk factors of all the older adults I consult with in the practice. 10. This ICF code set would assist me to identify the fall risk factors that warrant further referrals to other practitioners. 11. This ICF code set would enable me to more easily identify the type of health care disciplines to refer a patient to. 12. This ICF code set provides me with a common list of terminology to identify fall risk factors when communicating with other team members about specific patients.

(*table continues*)

Appendix (p. 2 of 5)

Clinical Utility Section (Conceptualized From Lesko, 2010, and Smart, 2006)

Component aspects	Operational definitions of components	Aspects to measure	Questions (Answer all questions on a 5-point Likert scale: from 1 = *strongly disagree* to 5 = *strongly agree*)
Relevance	Clinical relevance indicates whether the results of using a specific measure are meaningful (or not) for a specific HCP (Armijo-Olivo, 2018). In this study, this would refer to the consequential or meaningful information provided to the audiologists when using the ICF code in clinical practice.	• Discussing fall risk factors that could potentially improve HRQoL • Consequential information (meaningfulness)	13. Using this ICF code set would enable me to discuss specific fall risk factors with each older adult I consult with in my practice. 14. Discussing fall risk factors with the older adults I consult with could potentially decrease their fall risk and impact their HRQoL positively. 15. This ICF code set provides me with a tool to enrich the clinical process of identifying the fall risk factors relevant to the older adults I consult with in my practice. 16. This ICF code set could be a unique addition to the formal or informal clinical measures I use in practice. 17. This ICF code set failed to provide me with enough information to identify fall risk factors in older adults. 18. I was able to answer the questions regarding the case study quicker without using this ICF code set. 19. I consider spending extra time to use this ICF code set worthwhile as I think it increases the number of fall risk factors that I am able to identify.
Accessibility—This component includes questions about the financial considerations (e.g., cost implications, reimbursement) of using the measure (Smart, 2006)			
Financial considerations	Financial considerations are related to the value that is either given or received, directly or indirectly by using the specific measure (Napolitano & Saini, 2014; Smart, 2006). In this study, this section refers to the cost of using the ICF code set in clinical practice and the reimbursement by the patient (or by their medical aid) for using the code set during consultations.	• Cost implications • Reimbursement	20. I would use this ICF code set during consultations with older adults even if it increases the length of consultation time. 21. I do not think using this ICF code set should increase the cost of consulting with older adults. 22. I would use the code set in my practice if it is provided as a free resource. 23. It is important to me that patients or medical aids would reimburse me for using this ICF code set during consultations in addition to my usual procedures in the practice. 24. I would not use this ICF code set during consultations with older adults if I was not reimbursed for doing so. 25. Considering that there is currently no procedure code for using this code set, I would ask the patients to pay me for using this code set out of their own pocket.

(*table continues*)

Appendix (p. 3 of 5)

Clinical Utility Section (Conceptualized From Lesko, 2010, and Smart, 2006)

Component aspects	Operational definitions of components	Aspects to measure	Questions (Answer all questions on a 5-point Likert scale: from 1 = *strongly disagree* to 5 = *strongly agree*)
Practicability—This component includes questions about the functionality of the measure as well as the training needed to use the measure (Smart, 2006)			
Functionality	Functionality of a measure refers to the description of the measure, its goals or functions, and whether the measure meets these goals or functions (Alkhaldi et al., 2018). Functionality also refers to the practicability of the measure (Reiman & Manske, 2011). In this study, functionality relates to whether the ICF code set meets its goal of identifying fall risk factors in older adults, as well as the practicability of the ICF code set in terms of its intuitiveness and the audiologist's ability to obtain the code set.	• Meeting its goal of identifying fall risk factors • Intuitiveness of using the measure • Obtaining the ICF code set	26. This ICF code set provided me with all the information I need to identify fall risk factors in older adults. 27. There are certain fall risk factors that are not included in this ICF code set that I think are important when consulting with older adults. 28. I find the layout of this ICF code set logical and clear. 29. I find the fall risk factors used in this ICF code set clear and easy to understand. 30. I do not routinely search online or at libraries for new audiological measures or tools. 31. I regularly keep myself informed about current research and new publications in the field of audiology. 32. I would know where to find this resource once it is available for use.
Suitability	Suitability refers to the audiologist's perceived fit of using the code set in clinical practice.	• Perceived fit of the code set • Ease of use in clinical practice	33. I do not think this ICF code set should be an integral part of an audiologist's scope of practice. 34. This ICF code set is something I should use with every older adult I consult with in clinical practice. 35. I found that using this ICF code set was easy for me. 36. I think this ICF code set would be easy to use for health care practitioners in other disciplines (e.g., physiotherapy, ENT) who consult with older adults. 37. I find this ICF code too complex to be used effectively in my everyday clinical practice.
Training needed	The training needed for audiologists to use this ICF code set refers to their ability to easily use the code set in clinical practice.	• Additional training needed	38. I do not think I would need any additional training to be able to use this ICF code set in my practice. 39. I would only be able to use this ICF code set in my practice if I undergo additional training on the use of the ICF.

(*table continues*)

Appendix (p. 4 of 5)

Clinical Utility Section (Conceptualized From Lesko, 2010, and Smart, 2006)

Component aspects	Operational definitions of components	Aspects to measure	Questions (Answer all questions on a 5-point Likert scale: from 1 = *strongly disagree* to 5 = *strongly agree*)
Acceptability—This component includes questions about the ethical or social aspects of using the measure (Smart, 2006)			
Ethical considerations	Ethical beliefs include a person's personal moral code and individual beliefs of what is considered to be right or wrong. An ethical dilemma arises when a situation contains moral reasons both for and against a certain action and reasons that challenge one's ethical beliefs (Leon et al., 2012). The four main ethical aspects considered in this questionnaire were autonomy, non-maleficence, beneficence, and justice, as each one of these has the potential to influence the use of this code set by audiologists. In this study, ethical considerations include the audiologists' sensitivity to potential ethical concerns in using the ICF code set in their scope of practice.	• Autonomy • Non-maleficence • Beneficence • Justice	40. I think each patient should give informed consent before I use this ICF code set to perform a fall risk factor screening. 41. I do not think each patient should be given the choice whether they want me to use this ICF code set on them, as it forms part of my clinical judgment. 42. In my opinion, this ICF code set could potentially cause harm to the older adults I consult with in my practice. 43. In my opinion, not performing a fall risk assessment using this ICF code set on every older adult in my practice could potentially cause harm to them. 44. I think using this ICF code would not assist me in playing an active role in potentially reducing falls in older adults and potentially increasing their HRQoL. 45. I think using the ICF code set would enable me to play an active role in advocating for the use of fall risk identification measures by audiologists. 46. In my opinion, this ICF code set could help me to fulfill my role of educating patients regarding the reduction of fall risks. 47. I would be able to use this ICF code set to ensure a continuity of care of my patients when they consult with other audiologists in the practice.

(*table continues*)

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Clinical Utility Section (Conceptualized From Lesko, 2010, and Smart, 2006)

Component aspects	Operational definitions of components	Aspects to measure	Questions (Answer all questions on a 5-point Likert scale: from 1 = *strongly disagree* to 5 = *strongly agree*)
Professional utility—This component includes questions about the perceived benefits to the audiologist, as well as to their patients, of using this ICF code set (Lesko et al., 2010)			
Audiologist's view on the perceived benefit of the code set to the patient	Perceived value contains two aspects: On the one hand, it refers to the clinician's overall assessment of the benefit of a measure to the patient (Chen & Chen, 2010); on the other hand, it refers to the smallest change that the HCP considers to be meaningful and worthwhile to use the measure (Nwachukwu et al., 2017).	• Perceived benefit of using the ICF code set for patients	48. Using this ICF code set in my practice would not be advantageous to my patients as it would not enable me to provide higher quality service to them.
Value of the code set to the audiologist	In this study, the professional utility of the ICF code set includes the perceived benefit for the audiologist as an HCP when using this code set in a clinical setting, as well as the benefit for their patients.		49. I think using this ICF code set could assist me in educating the older adults I consult with regarding fall risk factors and could potentially reduce their risk of falling.
		• Perceived benefit for audiologists of using the ICF code set	50. This ICF code set is a desirable measure for identifying fall risk factors in older adults. 51. Using the code set would establish me as a leader in the field of vestibular audiology.
		• Value of code set for intervention strategies	52. Using the code set and performing fall risk assessments could ensure more referrals to my practice. 53. I think this ICF code set could assist me in determining the factors that need further intervention strategies. 54. By using this ICF code set, I would be able to implement further intervention strategies more easily than would have been possible without this code set.

Note. ICF = International Classification of Functioning, Disability and Health; HRQoL = health-related quality of life; STRATIFY = St. Thomas Risk Assessment Tool in Falling Elderly Inpatients; HCP = health care practitioner; ENT = ear, nose, and throat specialist.