Exploring the reliability of the Home Falls and Accidents Screening Tool (HomeFAST) when conducted and scored over the phone compared to face-to-face

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Abstract

Introduction: The frequency and impact of a fall increases with age. The Home Falls and Accidents Screening Tool (HomeFAST) is used to screen the fall risks of older adults (65+ years) by considering both an individual's functional capacity and socioenvironmental factors within the home. Whilst literature is readily available on the psychometric properties of the HomeFAST when administrated during face-to-face practice, there was limited knowledge on how the tool translates in a telehealth environment. Therefore, this study aimed to explore the reliability and validity of the HomeFAST when conducted and scored over the phone, compared to face-to-face.

Methods: Data were collected from older adults receiving occupational therapy services through an aged care organisation. The HomeFAST was initially completed over the phone by the primary researcher and then conducted by an occupational therapist during the initial home visit. Data were analysed using Intra-class correlation coefficient and Kappa statistics to provide measures of reliability.

Results: Data from 46-participants were analysed. The HomeFAST had an overall Intra-class correlation coefficient of 0.66 (95% CI 0.40 – 0.82) when comparing face-to-face to over the phone delivery. When considering individual items within the tool, reliability varied considerably (Kappa range -0.055 to 1.00).

Conclusion: This study adds to the current literature on the utility of the HomeFAST as a means of identifying fall risks in the home environment. The results of this study alone should not be used to support a transition from face-to-face to telehealth use of the HomeFAST. Therapists should exercise caution if using the HomeFAST over the phone as reliability is not supported for some items. Further research is indicated to validate the HomeFAST as a more reliable telehealth tool.

Keywords: accidental falls, older adults, screening tool, telehealth, reliability

Introduction

The unprecedented growth of the ageing population in Australia presents unique challenges to the healthcare system and those who work within it. Between the years 2000 and 2020, the proportion of people over 65 has increased from 12.4% to 16.3% of the total population (Australian Institute of Health and Welfare (AIHW, 2020). This is projected to grow over the next decade as more people born within the "baby boomer" era (between 1946 and 1964) will turn 65 (AIHW, 2020). Ageing is accompanied by an increased risk of health decline, disease burden, and functional limitations, that not only compromise the quality of life (QoL) of the individual, but can result in considerable health, economic, and societal consequences (AIHW, 2020; National Research Council, 2001; Lord et al., 2007).

An increased number of older Australian's are choosing to "age in place", that is remaining living in their own homes and communities whilst accessing aged care services delivered via public and private sectors (AIHW, 2018). This shift in personal preference has guided government policies and funding for services. Reforms in the Commonwealth Home Support Programme (CHSP) and Home Care Packages Program (HCPP) have reflected the increased demand for community and home-based care (Boldy & Horner, 2008; Department of Health, 2021a/b).

Ageing-in-place can be a positive approach to meeting the needs of older adults, supporting them to live independently or with assistance, in their own home for as long as possible (Wiles et al., 2012). A home can have variations in its meanings across cultures and generations, for many it is not just the physical house but the space that gives ongoing significance, attachment, and security (Ahn et al., 2020; Wiles et al., 2012; McCrea & Stimson, 2004; Löfqvist 2013; Stones &

Gullifer, 2016). The benefits of ageing-in-place often include maintained social connectedness, perceived independence and autonomy, improved wellbeing and support for valued roles, and a positive occupational identity (Boldy & Horner, 2008; Boldy et al., 2011). Despite these, the home environment can also contribute to a person's risk of sustaining an adverse event, such as a fall (Iwarsson et al., 2009).

Mackenzie et., al (2009, pp. 66) defined falls as an "unintentional event where a person accidentally comes to rest on the floor or a lower surface and is no longer weight bearing". While anyone can have a fall, the frequency, severity, health, and economic impact of having a fall increase with age (World Health Organisation (WHO), 2021). In Australia, falls are the largest contributor to hospitalised injury cases and are a leading cause of injury-related deaths worldwide (WHO, 2021; AIHW, 2021). In 2016-2017 three-quarters of all injury hospitalisations for older adults were the result of a fall (AIHW, 2019). Financially, this accounted for $3.6 billion (41%) of Australia's total injury expenditure on acute medical services (AIHW, 2020) and is expected to grow in line with the ageing population.

Falls can have a significant impact on the person, including prolonged physical injuries, disability, decreased mobility, deconditioning, loss of independence, social isolation, functional decline, and institutionalisation (WHO, 2021; American Occupational Therapy Association (AOTA), 2020; Hall & Hendrie, 2003; Australian Commission on Safety and Quality in Healthcare, 2009; Department of Health and Ageing (DHA), 2011; Elliot & Leland, 2018; Kelsey et al., 2012; Zhang et al., 2019). These immediate and potential long-term impacts can restrict the person's ability to participate fully in self-care, leisure, and community activities, as

unfamiliar environments and certain occupations may be restricted or avoided and can increase the demand for family, caregivers, and societal resources (Nielsen et al., 2017).

In older adults, falls can be attributed to several intrinsic (biological and psychological) and extrinsic (behavioural and socio-environmental) factors. Intrinsic factors include age-related declines in balance, decreased postural control and gait stability, visual and cognitive impairments, increased prevalence of acute and chronic illness, and the associated need for pharmaceuticals (Bloch, 2010; Deandrea et al., 2010; Lord et., al 2007). Extrinsic factors may consist of footwear choices, inadequate lighting, clutter, unsecured mats, or rugs, and slippery or uneven flooring/surfaces (Australian Commission on Safety and Quality in Healthcare, 2009; Bloch, 2010; DHA, 2011; Deandrea et al., 2010; Lord et al., 2007).

Given the relative risks and the personal and economic implications of falls, prevention is highly prioritised by those working with older adults living in the community (Elliot & Leland, 2018; Kelsey et al., 2012; Zhang et al., 2019). There is evidence supporting a multifactorial approach to reducing fall risks, of which occupational therapy plays a key role. Steultjens et al., (2004, p. 459) state that occupational therapists bring a "client-centred, problem-solving attitude" to the process of supporting older adults' independence, safety, and occupational functioning at home. Iwarsson and colleagues (2008), suggested the role of occupational therapists in falls intervention focuses on the relative risks associated with the person, their capacity and the pressure exerted by the environment.

Home environmental screening tools support this multifactorial approach to fall prevention and maintaining occupational performance. They aim to identify the factors that increase a person's fall risks and may be amenable to intervention (Australian Commission on Safety and Quality in

Healthcare, 2009). Indeed, screening for and resolution of environmental risks in the home is effective in preventing falls (Clemson et al, 2023). The Home Falls and Accidents Screening Tool (HomeFAST) is a standardised tool specifically designed for older people living in the community who are at risk of falls (Mackenzie et al., 2002b) and is used as a guide to address, eliminate or minimise identified risks in the home.

Telehealth

To reduce the spread of COVID-19, especially amongst the more vulnerable populations (including older adults), social distancing and self-isolation is encouraged, and sometimes enforced in certain settings. Implications of this response can limit people's access to skilled services and have called for a proactive response that changes the nature of health care provision (Ebbert et al., 2021; Manz et al., 2021; Sansom-Daly & Bradford, 2020). Consequently, there has been an unprecedented shift towards remote telehealth services. Telehealth is the use of technology to plan, implement and evaluate health intervention, education, and consultation from providers (AOTA, 2020).

The quality of telehealth services and clinical outcomes following the telehealth consult or visit are said to be comparable to those of traditional face-to-face services (Polinski et al., 2016; Isautier et al., 2020). Whilst literature is readily available on the psychometric properties of tools such as the HomeFAST, that are routinely used in face-to-face practice (Mackenzie et al., 2002b; Mackenzie, 2017; Vu and Mackenzie, 2012), there is limited knowledge on how such tools translate in a telehealth environment, and whether their psychometric properties are sustained.

The aim of this study was to explore the reliability of the HomeFAST when conducted and scored over the phone, in comparison to face-to-face.

Method

The project received ethical approval from the (removed for peer review) Research Ethics Committee (Application ID: 204276) and was approved by (removed for peer review) Clinical Governance committee**.**

Study Design:

The study used a quantitative methodology design to analyse the psychometric properties of the HomeFAST and therapist's ratings were regarded as the gold standard (Liamputtong, 2019).

Measurement Tool:

The HomeFAST uses a 25-item checklist, validated through expert consensus, to assess risk by considering both the functional capacity of an individual and socio-environmental factors within the home (Mackenzie et al., 2000). Previous research by Mackenzie et al., has demonstrated good inter-rater and test-retest reliability (ICC = 0.82; ICC = 0.77) of the HomeFAST (Mackenzie et al., 2002a; Mackenzie, 2017; Vu and Mackenzie, 2012). Each item is scored dichotomously (being present or not) or as not applicable based on the therapist's clinical observations (Mackenzie & Byles, 2018; Mackenzie et al., 2002a). The score for each item is 0 = yes (no hazard present), 1 = no (hazardous), and N/A (not applicable), providing an overall score out of 25 with a higher overall score indicating more hazards in the home, and therefore a higher risk of sustaining a fall.

Participants:

Inclusion criteria: Participants were eligible for the study if they:

- Were aged 65 years and above; 50 years and above for Indigenous Australians
- Lived in a community dwelling
- Were receiving initial occupational therapy services from (removed for peer review)
- Were receiving services through their CHSP funding
- Spoke English or had a chosen representative
- Provided written and verbal consent.

Recruitment and consent:

The chosen community organisation (removed for peer review), supports older adults in accessing and receiving desired services, including occupational therapy, using their allocated government funding. (removed for peer review) was selected as an appropriate organisation to collaborate with as they provide community based occupational therapy services and routinely use the HomeFAST as part of their initial assessment process.

Recruitment was completed in stages. Initially, referrals of new clients receiving occupational therapy services were screened against the eligibility criteria. (removed for peer review) staff then followed up with an initial telephone call. The purpose of the call was to firstly conduct a home safety check, as part of their routine practice, before negotiating a home visit time.

Secondly, to screen for the client's eligibility for this study using a set script and question tick-box to gain the client's verbal consent. The name, phone number and scheduled home visit date

of eligible participants who expressed interest in the study were recorded by (removed for peer review) staff on REDCap (Vanderbilt University, 2019), a secure, password-protected research database hosted by the (removed for peer review). These participants then received a follow-up phone call from the primary researcher who provided further information on the study and confirmed their verbal consent.

During the home visit, participants were provided with written information on the study and a written consent form for their participation and use of de-identified data. Participants were made aware of their option to withdraw from the study at any given point and were provided with the details to contact the researcher with any concerns. Reason for a participant's withdrawal from the study was not mandatory but was recorded if voluntarily provided; their data were excluded from the analysis.

Sample Size:

A priori sample size was calculated based on the previously published work of Vu and Mackenzie (2012). Using this existing data an ICC of 0.75 was hypothesised, with a precision 95% confidence interval (CI) and width no greater than 0.2. As such, for adequate precision and statistical power the proposed sample size for this study was 51 participants (Bonnet, 2002).

Data Collection:

To understand the descriptive characteristics of participants, demographic data such as age, gender, nationality/ethnicity, living arrangements and falls history were collected by the primary investigator from client records (see Appendix. 1).

The HomeFAST was initially conducted by the primary researcher, over the phone, and responses from the participant were collated to give an overall score. The primary researcher read the questions verbatim, providing additional information where needed. Definitions were provided to participants as a guide on what the hazardous item may include and what constitutes the item as being not applicable (Mackenzie et al., 2002a; Mackenzie & Byles, 2018). No feedback on results or recommendations for identified risks were given to the participant. Occupational therapists conducting the home visits were blinded to the initial HomeFAST score obtained over the phone to reduce potential bias. This was done by ensuring the initial score was stored in a separate research file, not attached to the participants clinical file, and only the primary researcher had access to the data.

During the initial phone HomeFAST assessment potential hazards may have been brought to the attention of participants. To reduce bias and the risk of minor modifications or behaviour changes being made by the participant between test ratings (Vu & Mackenzie, 2012), phone administration of the HomeFAST occurred no earlier than 24-hours before the occupational therapy home visit. All phone appointments and data collection were completed prior to the home visit being conducted. During the home visit the occupational therapist used their clinical observations of the home and functional tasks to complete the HomeFAST and provide a comparative score.

Given the model of service provision at (removed for peer review) seven occupational therapists were involved in the study. The occupational therapists formed an additional participatory group within the study and demographic information on their gender, experience working with older

adults and using the HomeFAST tool was obtained through an anonymous questionnaire (Appendix. 3).

Data Management:

All data were collected in REDCap (Vanderbilt University, 2019), before being downloaded and stored within the (removed for peer review) secure research servers. During the recruitment phase, each participant was allocated an ID number and participants' demographic information, telephone and face-to-face HomeFAST results were recorded on REDCap against their ID number.

Data analysis:

De-identified data were exported from REDCap (Vanderbilt University, 2019), in the form of electronic files suitable for analysis in Statistical Package for the Social Sciences (SPSS). Data from participants who did not provide consent or withdrew from the study were removed from the analysis. Participant's socio-demographic characteristics, including their age, gender, ethnicity/nationality, living arrangements and falls history, were described using descriptive statistics.

Reliability data analysis and interpretation were based on the past work of Mokkink et al.,(2020) which suggests Kappa Statistics and Intra-class Correlation Coefficient or ICC (2, 1; Two-way random effects with absolute agreement) are the best practice for recording reliability. These methods have been used in previous psychometric studies regarding the HomeFAST (Vu & Mackenzie, 2012; Mackenzie et al., 2002b; Romli et al., 2017). As each HomeFAST item is scored dichotomously, Cohen's Kappa was used to measure the agreement between telephone

and face-to-face for each categorical item. ICC scores were used to analyse the reliability of the overall HomeFAST scores.

Interpretation:

Landis and Koch's (1977) interpretation of Kappa scores, based on the work of Cohen (1960), are the commonly accepted ranges thus were used to analyse the data. Landis and Koch's (1977) suggested values ≤ 0 indicates no agreement, 0.01–0.20 as none to slight, 0.21–0.40 as fair, 0.41–0.60 as moderate, 0.61–0.80 as substantial, and 0.81–1.00 as almost perfect agreement. Similarly, Portney and Watkins (2009) guidelines suggested ICC values less than 0.5 indicated poor agreement, between 0.50-0.74 indicated moderate reliability, between 0.75–0.90 indicated good agreement, and values greater than 0.9 indicated excellent levels of agreement.

Results:

A total of 65 participants expressed interest in participating in the study. Of these, 19 were excluded from the analysis. Reasons for exclusion were, the participants home assessment was cancelled/rescheduled, or completed before they could be contacted for the phone interview (n=9), participants did not meet the inclusion criteria (n=2), they declined to participate (n=3), they did not provide written consent (n=3) or they were unable to be contacted by the primary researcher (n=2). As a result, a total of 46 participants were included in the sample. A group of seven occupational therapists were involved in the study, of which six were females. The experience of therapists ranged from new graduate-level to 12 years (M = 3.76 ± 3.97 years) practicing. Therapists had been working in community aged care or with older adults between less than one year to nine years (M = 3.19 ± 2.74 years). All therapists reported using the

HomeFAST less than five times a month. No therapists reported having used the HomeFAST over the phone.

Demographic characteristics of the sample group are shown in Table 1. Of the 46 participants, seven of the phone screenings were completed by a family member (e.g., a spouse, daughter or son) on the client's behalf. The person completing the phone screening was determined by the contact detail provided by (removed for peer review) to the primary researcher.

Table 2 displays the Kappa scores of individual items and their sensitivity. The ICC for overall HomeFAST scores between over the phone and face-to-face administration was 0.66 (95% CI 0.396 – 0.815). For all participants, phone administration of the HomeFAST occurred within 24-hours of the home visit.

Table 1. Demographic data of the sample (n = 46)

Characteristic	
Age (years, M (SD))	78.51 (6.2) Range 65 -93
Female	29 (63.0)
Male	17 (37.0)
Ethnicity	
Caucasian	38 (82.6)
Asian	1 (2.2)
European	6 (13.0)
Not stated	1 (2.2)
Primary Language Spoken at Home	
English	46 (100.0)
Current Employment	
Not in Paid Employment	45 (97.8)
Do Not Wish to Answer or Unknown Status	1 (2.2)
Falls in the Last 12 months	
No Falls	23 (50.0)
Has Fallen	21 (45.6)
Average Number of Falls = 2.48	
Data missing or not reported	2 (4.3)

Data presented as Count (%)

Table 2. Results of Kappa analysis for each item

Question	Kappa agreement between phone and face-to-face ratings	Phone and F2F percentage agreement for 'No'	Phone and F2F percentage agreement for 'Yes'	Interpretation according to Kappa ranges (Landis and Koch 1977)
1: Are walkways free of cords and other clutter?	0.443*	57.1%	89.7%	Moderate
2: Are floor coverings in good condition?	-0.055	0.0%	95.3%	No agreement
3: Are floor surfaces nonslip?	-0.030	97.7%	0.0%	No agreement
4: Are loose mats securely fixed to the floor?	0.225*	53.6%	57.1%	Fair
5: Can the person get in and out of bed easily and safely?	0.376*	60.0%	87.5%	Fair
6: Can the person get up from their lounge chair easily?	0.405*	70.0%	77.8%	Fair
7: Are all the lights bright enough for the person to see clearly?	1.00	100.0%	100.0%	Perfect
8: Can the person switch a light on easily from their bed?	0.367*	50.0%	95.5%	Fair
9: Are the outside paths, steps and entrances well-lit at night?	0.211	30.8%	90.3%	Fair
10: Is the person able to get on and off the toilet easily and safely?	0.200	31.3%	86.7%	None to slight
11: Is the person able to get in and out of the bath easily and safely?	-0.022	0.0%	-	No agreement
12: Is the person able to walk in and out of the shower recess easily and safely?	0.237	28.6%	90.6%	Fair
13: Is there an accessible/ sturdy grab rail/s in the shower or beside the bath?	0.607**	80.0%	81.0%	Substantial
14: Are slip resistant mats I strips used in the bath/ bathroom/ shower recess?	0.377*	69.0%	70.6%	Fair

15: Is the toilet in close proximity to the bedroom?	0.494**	87.5%	78.9%	Moderate
Question	Kappa agreement between phone and face-to-face ratings	Phone and F2F percentage agreement for 'No'	Phone and F2F percentage agreement for 'Yes'	Interpretation according to Kappa ranges (Landis and Koch 1977)
16: Can the person easily reach items in the kitchen that are used regularly without climbing bending or upsetting his or her balance?	0.087	50.0%	77.3%	None to slight
17: Can the person carry meals easily and safely from the kitchen to the dining area?	0.174	37.5%	81.6%	None to slight
18: Do the indoor steps/stairs have an accessible/ sturdy grab rail extending along the full length of the steps/ stairs?	0.326*	14.3%	100.0%	Fair
19: Do the outdoor steps/stairs have an accessible/ sturdy grab rail extending along the full length of the steps/stairs?	0.552**	79.2%	50.0%	Moderate
20: Can the person easily and safely go up and down the steps/stairs inside or outside the house?	0.377**	57.1%	61.5%	Fair
21: Are the edges of the steps/stairs (both inside and outside the House) easily identified?	0.244*	22.7%	72.7%	Fair
22: Can the person use the entrance door/s safely and easily?	0.237	28.6%	92.3%	Fair
23: Are paths around the house in good repair, and free of clutter?	0.211	50.0%	76.3%	Fair
24: Is the person currently wearing well-fitting slippers or shoes?	0.258*	100.0%	88.9%	Fair
25: If there are pets - can the person care for them without bending or being at risk of falling over?	0.635**	50.0%	71.4%	Substantial

Discussion:

The purpose of this study was to explore the reliability of the HomeFAST conducted and scored over the phone, in comparison to face-to-face. Results show an ICC of 0.66 suggesting the HomeFAST demonstrated moderate reliability when conducted over the phone compared to face-to-face administration (Portney & Watkins 2009). While the HomeFAST has known levels of inter-rater, intra-rater and test-retest reliability when used in the home, results of this study are not sufficient to support the use of the HomeFAST over the phone as a standalone tool or to replace face-to-face visits.

When considering individual items within the tool, reliability varied considerably. According to Landis and Koch's (1977) interpretations, three of the 25 items (2. condition of floor coverings; 3. nonslip flooring; and 11. safely getting in/out of bath) had Kappa scores in the negatives ($k \leq 0$) indicating no agreement and three items (10. safely getting on/off toilet; 16. safely reach items in the kitchen; and 17. safely carrying meals) had none to slight agreement ($k = 0.01–0.20$). Most items (n =13) had Kappa scores ranging from 0.21 to 0.40 suggesting fair reliability between the two rating approaches and 3/25 items (1. cords/clutter in walkways; 15. toilet close to the bedroom; and 19. grabrail on outdoor steps) had moderate reliability with Kappa scores between 0.41– 0.60. Two of the 25 items (13. grabrails in the shower; and 25. ability to care for pets) scored higher and had substantial agreement ($k = 0.61–0.80$) and only one item (7. Adequate lighting) displayed perfect agreement ($k = 1$).

The low Kappa scores for individual items can be explained by the low proportion of true positives (participants correctly identified over the phone and face-to-face as having that hazard in their home) and/or a low proportion of true negatives (participants correctly

identified over the phone and face-to-face as not having the hazard in their home). For example, item 2 (condition of floor coverings) had no agreement as the hazard was identified three times during the phone screening but not identified at all during the home visit . Likewise, item 3 (nonslip flooring) had no agreement as the hazard was identified in all homes when screened over the phone, however, was scored as not present twice during the home visit. As both questions focus on the condition of floor surfaces, the interpretations may vary. An occupational therapist rating these questions would consider different factors than a person rating their own flooring. This variability in interpretations emphasises the need to follow up and review these potential hazards during a home visit to confirm their scoring and risk to the client.

In this study, the items with low agreement in Kappa scores may be more subjective and influenced by a range of factors including the nature of the question, input of participants, clinical reasoning of therapists, and the limitations of using telehealth such as hearing and communication difficulties.

Items that had moderate and substantial levels of agreement ($k = 0.50\text{-}0.80$) focused on the observable features of the physical environment, such as the equipment and modifications (if any) in situ and the home layout. These items required less subjective input/judgement and are often fixed, meaning they could be perceived and reported the same by the participant and therapist.

The individual items that had no agreement or only slight agreement ($k < 0.2$) relate to how a person interacts and functions within their environment. Findings from this study align with that of Romli et al., (2017) who found items involving a judgement of an individual's

functional ability or qualitative assessment/observations had lower inter-rater reliability compared with items that scored observable physical features of the home. This may be because items that use the terms *'easily'* and *'safely'* are highly subjective, value-laden, and are said to occur across a continuum rather than being easy or difficult and safe or unsafe. While a therapist conducting a home visit may complete functional assessments of tasks, for instance, getting on and off a chair or the toilet and reaching for items in the kitchen, they require a level of professional judgment and experience to assess and score these accurately. A more experienced therapist may also use other types of clinical reasoning to inform their decisions regarding if an item is hazardous or not for that client, aside from observations and client reporting's alone.

Additionally, older adult participants who scored these items over the phone required insight to accurately report their performance to the administrator. In instances where a family member completed the HomeFAST on behalf of a client, statements such as "xxx would deny having any difficulties with this" or "xxx doesn't think there is a problem but there is" were common. These comments display how older adults may have a different perception of their abilities and what they choose to report can vary from their reality.

Variations in reporting may also be influenced by personal preference for the current home setup (based on their own habits, routines), and the stigma and identity shift attached to changes in everyday functioning that perceive the person as being vulnerable, incompetent, or "old" (Charlton et al., 2018; Hanson et al., 2009). It is therefore possible that participants underestimated and underreported the presence of hazards in their home when completing the phone screening, encouraging scoring discrepancies.

There is debate in the literature on the level of Kappa that should be accepted in health research (Landis & Koch, 1977; McHugh, 2012; Stelmer, 2004). Cohen's guidelines (1960) and the work of Landis & Koch (1977) consider scores between 0.41-0.60 as "moderate", meaning scores as low as 0.40 may be acceptable. While the HomeFAST is not used as a diagnostic tool but aims to identify the factors that increase a person's fall risks and may be amenable to intervention; accepting a Kappa score as low as 0.40, as suggested by Cohen (1960) and Landis & Koch (1977), would not be acceptable in clinical practice. Perhaps the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) criteria for acceptable reliability (Kappa ≥ 0.7) would be more relevant for clinical practice (Mokkink et al., 2020).

The HomeFAST should not be used over the phone as a standalone assessment as the professional and clinical risk in an older adult population, living at home and at risk of falls, is too high. If a therapist is considering completing the HomeFAST over the phone, they need to be aware of the low reliability for particular questions and incorporate other means of gathering information, such as using a laptop, ipad or smart phone to take photos/videos that "show" the therapist the home environmental feature being assessed, skilled follow-up questioning and/or scheduling a home visit. These methods may allow the person's level of risk to more accurately be quantified/determined and may provide a guide for planning interventions that address, or minimise identified risks (AOTA, 2020; Mackenzie, 2017). Further consideration should also be given to the development and validation of a phone version of the tool.

The original version of HomeFAST was not designed for use over the phone, as important contextual, environmental, and individual factors could be misinterpreted when not observed by the therapist. However, with the shift to provide telehealth services it is important to consider the potential benefits and limitations of telehealth and using the HomeFAST over the phone. Gradual deterioration of hearing is common amongst older adults, which can make verbal communication and interpretation via telehealth means difficult (Bowl, & Dawson 2019; Este, 2013). This can be further influenced by external factors like background noise and the presence of others as telehealth often occurs outside of a controlled environment. In all cases, questions were initially asked according to the standardised version of the HomeFAST, however, their delivery via telehealth made it difficult for some participants to understand. To facilitate participant's understanding, the primary researcher was often required to repeat the question, use simplified language, and/or provided a follow-up example of how the hazard may present within their home based on the definition provided under the question. While this may have encouraged a more accurate response to questions, the HomeFAST is considered a standardized tool with a consistent application procedure and scoring system, and demonstrated psychometric properties (Mackenzie et al., 2002a; Mackenzie, 2017; Vu and Mackenzie, 2012). Therefore, modifying the wording may have impacted its overall validity. In practice, the appropriateness of adopting a telehealth method of service delivery should be assessed on a case-to-case basis. The therapist completing a tele-HomeFAST should be aware of signs/indications that the client is not following the conversation, has misinterpreted the question, and when questions may need to be repeated, rephrased, or expanded upon. Therapists should consider using elements of the HomeFAST self-report via telehealth to improve validity, the understanding of questions and

accuracy of responses. However, the validity of using multiple modalities or a combination of these tools is currently unknown and should be considered.

To align with previous studies (Lampiasi & Jacobs, 2010; Pighills et al., 2016; Romli et al., 2017), the therapist completing the home visit was considered the 'expert rater' or ‘gold standard’ as they have greater familiarity with completing environmental and functional assessments and with the scoring criteria and interpretation of the HomeFAST items. To fit within the model of service provision seven occupational therapists were involved in this study. Despite being the expert rater, having multiple assessors could be another source of potential variability and bias, as it adds to a level of inter-rater difference. Home visits completed by therapists in this study did not solely focus on screening for potential fall risks. All participants were receiving services through their CHSP funding. Therefore, the purpose of the home visit was guided by the areas of difficulty the client was experiencing at home, as identified during their Aged Care Assessment Team (ACAT) assessment. As a result, each item was not assessed with the same level of detail, it is likely the therapist did not observe all aspects of the client's home environment or the client completing all functional tasks listed in the HomeFAST. The therapist may have relied on asking questions to obtain the client’s perception/self-reporting of tasks, making deductions based on their clinical presentation and transferable skills and highlighting items that require further assessment during an additional home visit. Likewise, if the therapist was not focused on screening for falls, they are likely to have completed the HomeFAST form after the home visit meaning there is an increased demand for accurate recall of observations and likelihood of errors.

In this study, the primary researcher was blinded to the client's current diagnosis, past medical history, falls history and prior assessments or occupational therapy interventions. As the therapist had access to client records, they had a broader understanding of the effects of disease and disability on the client's ability to carry out occupations, the contextual barriers that may exist, or any assistive devices/equipment and home modifications already in place. Therefore, the therapist could use diagnostic reasoning (knowledge of the client's condition, which may be progressive or fluctuate across the day) (Unsworth, 2011) to prepare for the home visit, better evaluate HomeFAST items and make inferences or 'educated guesses' when uncertain or when items were not observed/assessed. The need to have a comprehensive understanding of the multifactorial risks associated with falls when completing fall screenings, assessments and interventions has been well explored in the literature (Deandrea et al., 2010; De Vries et al., 2010; Elliot & Leland, 2018). Likewise, the study on the clinical utility of the HomeFAST by Mackenzie (2017), discusses how administrators used their understanding of the intrinsic contributors (such as visual and cognitive impairments, changes in mobility and balance and the need for pharmaceuticals) to help identify a person's level of falls risk and rate HomeFAST items. However, as the HomeFAST is a point-in-time assessment there is a need for reassessment as client circumstances change to allow fall risks to be monitored over time.

Study Limitations:

The results of this study should also be considered in relation to the known limitations. The literature acknowledges that home hazards are complex and are not standardized between people. Hazards may present/appear differently between populations and homes and may

equally be interpreted differently between observers. As there were multiple assessors involved in the study, each had varying levels of clinical experience in completing home visits, working with older adults and using the HomeFAST. This may have increased the variability of assessment and scoring as the degree of risk associated with HomeFAST items could be over or underestimated.

Training on the use of the HomeFAST, including an orientation to the terms used and instructions on how to score the instrument was not provided to the primary researcher who had no previous experience using and scoring the HomeFAST. Likewise, this study did not provide supervision by researchers of the use of the HomeFAST by occupational therapists, nor did it ensure therapists had access to the HomeFAST user manual or received previous training from an employer. Ongoing training is a consistent recommendation in previous studies of the HomeFAST to improve reliability outcomes (Romli et al., 2017; Vu & Mackenzie 2011). This study has demonstrated the benefits of ongoing education to decrease variability in interpretations and scorings. After the phone administration of the HomeFAST, no feedback was provided to the participant regarding if fall risks presented within their home and how these could be explored through further assessment and intervention. While the home visit occurred within 24-hours of the phone screening, the nature of the HomeFAST questions may have prompted minor modifications to be made between test ratings. This could be another source of scoring error as questions that were answered ‘no’ over the phone, may be scored as ‘yes’ during the home visit. Therapists completing the home visit were blinded to the phone screening results, consequently, they could not dictate whether changes had been made between test ratings.

The priori sample size estimation based on Bonnet (2002) was 51. Whilst the study achieved a sample size of 46 participants, the ICC (0.66) was lower, and the 95% CI was larger than hypothesised, resulting in this study being underpowered. The smaller than required sample size is reflected in the wide confidence level (difference 0.42), which is an imprecise measure. Further research with a greater sample size (~100 – 150) is suggested, to allow a stronger recommendation regarding the use of the HomeFAST over the phone to be made.

The sample used in this study was representative of the population who were referred to and receiving services through one local aged care provider, from a small geographic area, and who met the inclusion criteria. The sample showed consistent demographics (i.e., gender, socio-economic status, language, culture) that may not be representative of the larger population. Caution should therefore be used when interpreting these results on a larger scale and with different population groups. Further research to establish the reliability of the HomeFAST as a telehealth tool for those not included in this study, such as those with non-English backgrounds, should be considered.

Conclusion

This study adds to the current literature on the utility of the HomeFAST as a means of identifying fall risks in the home environment. Results do not support the use of HomeFAST over the phone in place of face-to-face visits and screenings. High variations in Kappa scores indicate how some items are highly subjective and may be influenced by a range of factors such as directly observing functional activity in the home.

Key Points for Occupational Therapy

- Home based assessments are a vital part of occupational therapy service delivery, often requiring high level complex observations and clinical reasoning.
- The use of HomeFAST in a telehealth setting is supported by the results of this study, and therapist should exercise caution if using the tool in this way
- Further research exploring the type and use of home assessment tool in telehealth is warranted.

Declaration of Authorship:

IK: introduction, study design/methodology, recruitment, data collection, data analysis and interpretation, manuscript preparation. At the time of study completion IK was a Ba. Occupational Therapy (Hnrs) student at University of South Australia.

SM, LW and BS: introduction, study design/methodology, recruitment, data collection, data analysis and interpretation and manuscript preparation.

JS: Design/methodology, recruitment and manuscript preparation

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