

Acceptability of fall prevention strategies for older people with vision impairment

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This article was edited by Dr Mike Steer and Dr Desiree Gallimor.

Abstract

Despite the high risk of falls for older people with vision impairment, adherence to exercise-based fall prevention programs is low. We investigated the attitudes of older people with vision impairment to fall prevention programs as well as home modifications. This was completed through focus group and semi-structured interviews with 19 community-dwelling people aged ≥ 63 years with vision impairment. The results indicated that participants did not attribute falls to vision impairment, nor consider themselves appropriate candidates for a fall prevention program. Participants also reported such barriers as competing priorities, transport issues and comorbidities. It is recommended that exercise-based fall prevention programs cater to the unique challenges of this population, such as delivery in home by Orientation and Mobility Specialists.

Falls are a major health concern for older people (Clarke et al. 2015), with a third of those over the age of 65 years likely to experience a fall each year (Campbell et al. 1990). Older people with vision impairment are at a higher risk of falls estimated as eight times more likely to experience a fall, as well as a fall that results in a fracture (Ivers et al. 2002). This demographic are at a higher risk of falls because of difficulty detecting hazards (Legood et al. 2002), but it is also likely that impaired strength and balance (Lamoureux et al. 2004; Chen et al. 2011), sedentary lifestyle (Loprinzi et al. 2014) and exercise avoidance (Clemson et al. 2008) contribute to risk. With an ever-increasing population of older people with vision impairment (Taylor et al. 2005), the need for effective fall prevention strategies has never been so crucial.

The 2012 Cochrane Review on interventions for preventing falls in community-dwelling older people (Gillespie et al. 2012) concluded that group and home-based exercise programs, as well as home safety and medication management, reduce the rate and risk of falling in older people. Furthermore, exercise programs that include the optimal dose and include exercises that provide a high challenge to balance can reduce the rate of falls by around 30% to 40% (Sherrington et al. 2011). However, of the 159 included trials, few trials included participants with vision impairment, and only one trial included participants with severe vision impairment (Gillespie et al. 2012). Consequently, it remains unclear how these findings can be generalized to older people with vision impairment.

Results of a meta-analysis within a recent systemic review by Gleeson et al. (2014) found that multimodal exercise positively impacts on physical functioning in residential-dwelling older people with vision impairment. However, although the Otago Exercise Programme has been shown to reduce falls by up to 35% in the general population (Thomas et al. 2010), one trial in the systematic review found no significant effect on risk of falls for those with vision impairment after completion of the program (Campbell et al. 2005). Only one of the four trials included in the systematic review was completed in community-dwelling people, and none of the trials measured the attitudes of participants in order to help explain their findings.

An individual's attitude toward the benefits and disadvantages of exercise has been demonstrated to influence intention to participate (Yardley et al. 2007). However, few studies have investigated how the attitudes of community-dwelling older people with vision impairment influence adherence to fall prevention programs. The current study aimed to investigate attitudes towards fall prevention interventions in community-dwelling older people with vision impairment. A qualitative approach (Vaismoradi et al. 2013) was used to examine the ways that two types of exercise-based fall prevention programs (The Otago Programme and Tai Chi), as well as home modifications, would be considered acceptable to people in this vulnerable demographic. To our knowledge, this is the first study which has focused on the attitudes of community-dwelling older people with vision impairment to fall prevention strategies.

Method

Study participants

Older people with vision impairment were recruited through convenience sampling. Flyers were placed on community noticeboards, via organizations and support groups which assist people with vision impairment (i.e., Guide Dogs NSW/ACT, senior citizen centres, churches, Probus groups and gardening groups) in the south-western suburbs of Sydney, Australia. People interested in participating registered their interest with the facilitator through a phone call, email or filled out their contact details on a sign-up sheet attached to the flyer. Eligible participants were 60 years of age or older with reduced functional vision or legal blindness. To ensure participants were able to contribute to discussions, participants were excluded if they could not speak conversational English.

The study was approved by the University of Sydney Human Research Ethics Committee (Reference number 14111). The study is reported in line with the COREQ statement (Tong et al. 2007), supporting transparency in the reporting of qualitative research.

Data collection

Focus groups were used to explore the acceptability of different fall prevention programs from the perspectives of older people with vision impairment. Due to the high likelihood of mobility restrictions within the population of interest, semi-structured interviews in participant homes were also offered to increase the scope of participant inclusion. Both focus groups and interviews are robust methods of obtaining comprehensive qualitative information and have been used many times to explore the opinions of people in fall prevention research (McMahon et al. 2011).

Each focus group and semi-structured interview was led by an orientation and mobility (O&M) specialist (facilitator) from Guide Dogs NSW/ACT, a non-government organization providing community-based support for people with vision impairment. Participants provided written, informed consent and completed a baseline data collection form that included demographic information, diagnosis of vision and comorbidities and mobility details. To ensure consistency between the focus groups and interviews, an open-ended and semi-structured script was used on each occasion (Table 1). The facilitator began discussions with an "ice-breaker" question and would refer back to the script for prompts to facilitate further conversation around the discussion topics. To confirm correct interpretation of the salient themes, the facilitator reviewed these with the participants at the end of each discussion. Each focus group and semi-structured interview was recorded and lasted between 1 and 2 hr.

After completion of each focus group and semi-structured interview, participants were asked to complete the attitudes to falls-related interventions scale (AFRIS). The AFRIS is used to measure why a participant would accept or reject a falls-related intervention. A home-based strength and balance training program was described, after which, participants rated each of the six questions from "disagree strongly" to "agree strongly" on a seven-point Likert scale. Questions included "intervention would be good for me" and "I am the kind of person who should do intervention" (Yardley et al. 2007).

Table 1. The script used in each focus group and semi-structured interview, including ice-breaker question, areas of discussion and associated prompts.

Ice-breaker question	
‘To start with, I want you to introduce yourselves, one at a time using your first name only, and tell the group if you have experienced having a fall or fear having a fall, been injured having a fall or know of someone who has had a fall over the age of 60 years.’	
Area of discussion	Prompts used
Vision loss increases the risk of falling	Is there an increased risk of falling because of vision loss? What are your current challenges and coping skills? What is the impact of injurious and non-injurious falls?
Awareness of preventative strategies to minimise harm from falling	What are the attitudes and opinions of current programs? Under what circumstances would you participate or not participate? Would you be willing to engage in group or individual exercise programs or would you prefer to have modifications made to reduce risk of falls in your environment?
Description of three different fall prevention strategies and environmental modifications	The Otago Exercise Programme E.g. What are your likes and dislikes of a home-based exercise program? Tai Chi group classes E.g. What are your thoughts on group programs, location, transportation and timing? Home modifications E.g. What have you tried already? What has worked and what hasn’t worked and what would you like to change in your home?
Adherence to exercise programs	What are your preferred physical activities and what do you do at the moment? What are the barriers to exercise? What are the psychological barriers to physical exercise? What are the psychological benefits to exercise? What are your opinions on well-designed appropriate programs aimed at older people who have a vision impairment to reduce the risk of falls?

Following all the focus groups and semi-structured interviews, recordings were transcribed verbatim by the facilitator. Transcripts were then analysed using the QSR International’s NVivo 11 qualitative data analysis Software.

Data analysis

Using deductive analysis protocols, the transcripts were coded by researchers (LD and LK) within the framework of the behaviour change wheel (BCW) (Michie et al. 2011). The BCW is a three-layered model that describes the interrelated relationships between sources of behaviour, intervention functions and policy categories (Fig. 1). The inner wheel, or ‘hub’, recognizes that a participants’ engagement with an intervention is influenced by the interaction between capability, opportunity and motivation. The next layer outlines intervention functions that can support the behaviour sources. The outer layer of the wheel outlines the policy categories, which facilitate intervention functions (Michie et al. 2011). These interactions could help us better understand the engagement of older people with vision impairment in fall prevention strategies.

Through comparison and discussion of the transcripts, authors achieved consensus on the most common themes that corresponded to the BCW. After which, excerpts from the transcripts were selected to help illustrate the identified themes.

Results

Nineteen people participated in the focus groups and semi-structured interviews in October 2011. The age of the participants ranged between 63 and 91 years with an average age of 76 years (Table 2). Twelve participants took part in the two focus groups. Four participants attended the first focus group and eight participants attended the second focus group. Seven participants completed a semi-structured interview in their home.

Using the BCW framework, several themes were identified under the constructs in sources of behaviour and intervention functions (Table 3). Policy level considerations were not raised in the focus groups and semi-structured interviews and were outside the scope of the current investigation. The identified themes are described below, along with quotes from participants with their sex, male (M) or female (F), age and whether

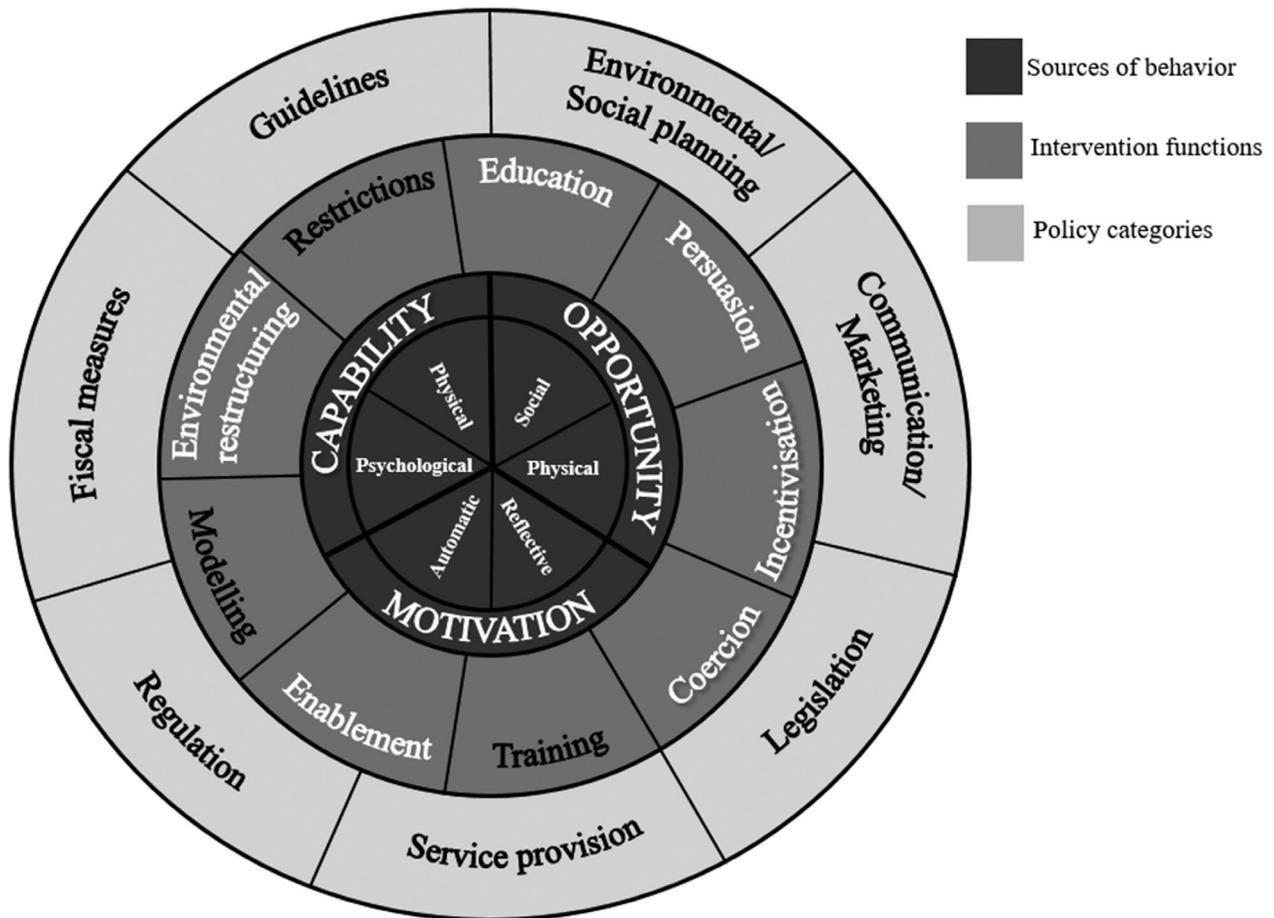


Figure 1: The behaviour change wheel, adapted from Michie et al. (2011). Parts of the wheel that were identified as relevant to this study appear in white.

they were involved in focus group discussion (FGD) 1 or 2 or a semi-structured interview (SSI).

Sources of Behaviour

Capability

Psychological: “Falls are just bad luck!”

Although participants acknowledged that vision loss could have an effect on the likelihood of falling, most attributed falls to other physical factors or merely being clumsy: “I couldn’t say it was my eyesight, I think it was just being careless” (F, 91, SSI), “I did have a fall last May, it was just bad luck” (F, 83, FGD2) and “The falls I’ve had I’d say it was my own fault because I wasn’t watching where I was going or where I was walking” (F, 73, FGD1).

Physical: “Exercise will hurt”, competing priorities and vision loss limits safety and mobility.

Participants were unwilling to complete an exercise-based fall prevention program because of

an existing injury or medical condition: “I don’t walk far on my own, plus I can’t due to emphysema” (F, 85, SSI). Participants noted that they had too many other competing priorities to devote themselves to an exercise program: “I don’t have time to go to them, I’m too busy with my voluntary work and visiting my son and my friends, and I would if I had time” (F, 91, SSI). Vision loss made some participants feel like a target in the community or unable to participate in an intervention: “having that stick [long cane] makes me stand out like a neon light and that’s another reason why I don’t like going out” (F, 82, SSI) and “While I can still see [I do exercise], but if my sight deteriorates, I don’t know” (F, 78, FGD1).

Motivation

Reflective: “Already doing enough, belief in their own ability and use it or lose it”

Some participants believed that they were already doing enough around the house and in the

Table 2. Characteristics of the study population.

Age	76 ± 8 (range 63–91)
Gender	16 female, 3 male
Vision condition	6 age-related macular degeneration (AMD), 5 cataract, 2 cataract and glaucoma, 1 cataract and AMD, 1 cataract, glaucoma and retinitis pigmentosa, 1 cataract and undisclosed, 1 glaucoma and AMD, 1 glaucoma, 1 undisclosed
Housing	17 house, 2 unit
Lives alone	11 (58%)
Mobility limited due to vision loss	5 (26%)
Mobility aids	4 support cane, 3 walking/rollator frame, 2 human guide, 1 long cane, 1 quad stick, 8 none

community to keep fit and more exercise would not impact on them: “*Well I wouldn’t do this [Otago Exercise Programme] because I am happy with the exercise I currently do and if I feel like I need more then I do a walk*” (F, 77, FGD2). Participants’ belief in their own ability or self-efficacy was regularly acknowledged. Participants noted that they do not believe in their ability to begin and continue exercise, or had failed in the past: “*I wouldn’t do them [Tai chi classes], I’m a bit lazy like that*” (F, 76, SSI). Conversely, participants recognised that there are positive benefits of exercising and that not exercising may be bad for their psychological and physical health: “*Well I’ve always said to myself if you don’t move then you’re going to lose it*” (F, 91, SSI) and “*Yes, it’s a good thing to do [participate in a fall prevention program], makes you feel better inside and out*” (M, 62, SSI).

Automatic: ‘Closed to trying new things’ and ‘depressive mood state’

Although participants noted the psychological and physical benefits of exercise, many remained unwilling to participate in a fall prevention program. In the extreme, one participant advised that her mood would influence her engagement in an exercise program: “*I get a bit anti-social, when I get depressed I tend to draw into myself*” (F, 76, SSI).

Opportunity

Physical: ‘I can’t get to a venue’ and ‘I don’t want to be a burden on my loved ones’

The most cited barrier to participating in an exercise-based fall prevention program was public transport and travel issues: “*It’s got a lot to do with the travel for me but the buses and the trains are a real issue for me, I hate them too. It really depends where they are held*” (F, 83, FGD2). Participants did not want to burden loved ones for travel to fall prevention programs: “*The location [of a fall prevention program] would also be an issue for me, it depends on when my husband would have time also and I wouldn’t want him to have to wait for me*” (F, 82, SSI).

Social: Stigma of participating in a fall prevention program and benefits of participating in groups

Participants were unwilling to make the link between vision impairment and falls, use a mobility aid, or consider themselves an appropriate candidate for a fall prevention program: “*That would be an admission of getting old [when asked for thoughts on what can be done to reduce fall risk] and I’m not going to do that*” (M, 62, SSI). Conversely, participants, particularly those in the focus groups, recognised the benefits of being in a group when exercising: “*I would much rather do it [exercise] as a group*” (F, 91, SSI).

Intervention functions

Environmental restructuring

Preference for home modifications, for home-based programs, and reduced mobility due to uneven footpaths.

Home modifications were noted regularly in the discussions, as an easy fix for a complicated problem: “*I’m all for handles, rails, I’d prefer having them than exercising actually*” (F, 78, FGD1). Some participants advised that they would prefer individual programs in their home to group programs requiring travel: “*I’m not into group anything, I’m a singular person, I can do it myself*” (M, 76, SSI). Reduced mobility due to uneven footpaths was noted as a barrier to participants getting out into the community safely. Thus limiting their opportunity to participate in a fall prevention program outside of their home: “*Just about everywhere you go the footpaths are either broken and or uneven*” (72, FGD2).

Education: No awareness of fall prevention programs

Table 3. Themes identified using the components of the behaviour change wheel (BCW).

BCW Component	Construct	Subset	Themes
Sources of behaviour	Capability	<i>Psychological</i>	'Falls are just bad luck!'
		<i>Physical</i>	'Exercise will hurt' Competing priorities Vision loss limits safety and mobility
	Motivation	<i>Reflective</i>	'Already doing enough' Belief in own ability 'Use it or lose it'
		<i>Automatic</i>	Closed to trying new things Depressive mood state
	Opportunity	<i>Physical</i>	'I can't get to the venue' 'I don't want to be a burden on my loved ones'
		<i>Social</i>	Stigma of participating in falls prevention program Benefits of participating in groups
Intervention Functions	Environmental restructuring		Preference for home modifications Preference for home-based programs Reduced mobility due to uneven footpaths
	Education		No awareness of fall prevention programs
	Persuasion, Incentivization & Coercion		Doctor's influence
	Enablement		Consistent and supportive interventions.

None of the participants had heard of the Otago Exercise Programme. They had, however, heard of Tai Chi, but had not considered the benefits in relation to fall prevention: "No I haven't heard anything about any of those [Otago Exercise Programme] programs" (F, 82, SSI) and "Oh yes [have heard about Tai Chi], but I'm not going to do that" (F, 85, SSI).

Persuasion, Incentivization and Coercion: Doctor's influence

Participants advised that they would be more willing to undertake a fall prevention program if their doctor told them it would be a good idea: "If they [doctor] told me something like that and I thought that it would be good for me then I certainly would do it" (M, 76, SSI).

Enablement: Consistent and supportive interventions

Participants advised that more successful fall prevention programs would reduce barriers and

increase means to participation: 'Firstly support them, encourage them, boost their confidence and provide ongoing care really. See the person on a regular basis, see how they are going with the program, that sort of thing' (F, 76, SSI).

Seventeen participants completed the AFRIS. The participants responses are reported in Figure 2, including an average score of the participants' responses. On average, participants were in slight agreement that an individual-based fall prevention program was right for them. The construct with the most agreement was "I intend to do Intervention if I am offered the opportunity". The construct with the least endorsement was 'I am the kind of person who should do Intervention'. Interestingly, 'If I wanted to, it would be easy for me to do Intervention' was both the second most agreed and disagreed construct, indicating that responses from participants were mixed.

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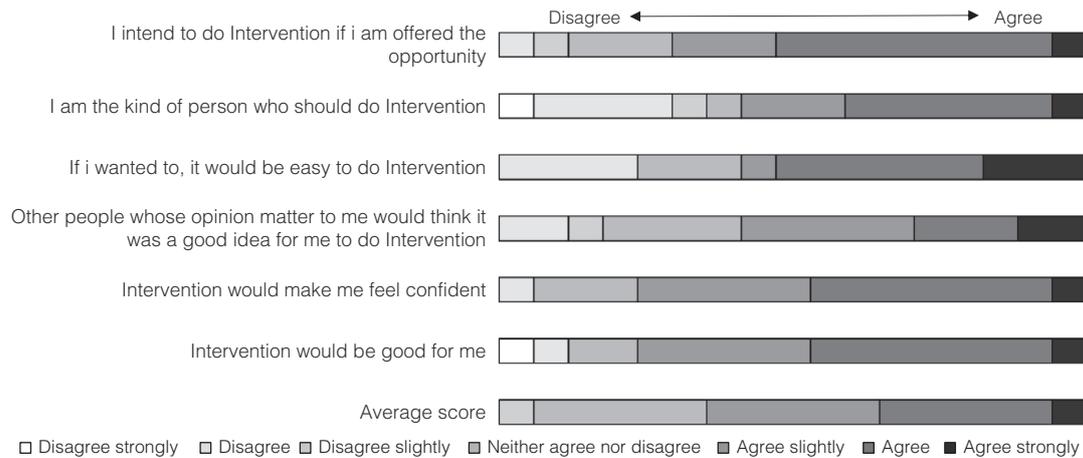


Figure 2: Responses of participants to the attitudes to falls-related intervention scale (AFRIS). Intervention refers to a home-based strength and balance training program.

Discussion

Exploring the attitudes of older community-dwelling people with vision impairment to fall prevention programs is an important step in determining what programs would be considered acceptable for this population. Using the framework of the BCW, results of this study suggest that participants are reluctant to access exercise-based fall prevention programs because of transport issues, competing priorities and a belief that fall prevention programs are not relevant to them. In contrast, participants were generally positive about the benefits of exercise more broadly and home modifications.

Two key issues were identified from the data; (i) study participants did not attribute falls to vision impairment, and (ii) study participants did not acknowledge that they themselves were an appropriate candidate for a fall prevention program. A systematic review by Bunn et al. (2008), evaluated interventions that promoted adherence to, or participation in, a falls prevention program. Our small study provides some support for the factors they identified, including attributing falls to causes outside of the individual's control, as well as underestimation of the risk of falling as an individual ages. Similarly, Yardley et al. (2007) identified that being labelled as 'a falls risk' might be incongruent with the individual's self-image. Further, fall prevention programs might be unappealing to participants because the negative implications can appear patronising and distressing (Yardley et al. 2007).

Barriers for the participants in accessing fall prevention programs also included competing priorities and issues with motivation. This is similar to the general Australian population where only 46% of people follow

minimum recommended levels of activity (Wales et al. 2012). The level of activity is even lower again in older people, where 12% participate in strength training, and 6% participate in balance training (Merom et al. 2012). Participants also reported transport issues as a barrier to participation. This finding is supported by Gleeson et al. (2014) who found that travel for those with vision impairment can be demanding because of the attention required to identify hazards, use mobility aids and remember routes successfully. Participants also disliked the idea of exercising due to existing injury or medical issue. Similarly, Yardley et al. (2007) suggested that co-morbid illness can reduce adherence to fall prevention programs.

Alternatively, participants were positive about the benefits of exercise. Yardley et al. (2007) have previously identified that people are much more likely to want to participate in a program when they are presented with the positive connotations of healthy ageing, maintaining function, and increasing independence. Our study participants were also positive about home modifications. Lord et al. (2006) analysed the results of six case-controlled prospective studies addressing environmental risk factors for falls in Community-dwelling people. Lord et al. (2006) identified that a high proportion of falls are attributed to hazards around the home. Consistent with this result, home modifications have successfully reduced falls in older people with vision impairment (Campbell et al. 2005). However, Campbell et al. (2005) suggested that identifying risks in the home does not address the physical limitations that also contribute to falls.

The results of our study should be considered along with a number of limitations. First, only the attitudes of participants to fall prevention programs

were investigated and did not provide any measure of actual exercise adherence. However, intention to participate has been identified as a predictor of immediate behaviour change (Webb and Sheeran, 2006). Second, the study only included nine transcripts for analysis, including both focus group and semi-structured interviews. However, Guest et al. (2006) proposed that saturation of data in qualitative research can occur within the first 6 to 12 interviews. It is a strength that the study was expanded to include individual semi-structured interviews as well as focus groups. Including people with vision impairment who are unable to travel for a group discussion, let alone an exercise program, gave us a wider view of the unique challenges this population faces.

A number of suggestions to increase adherence to an exercise-based fall prevention program can be cautiously deduced from the study results. Due to the varied attitudes of older people with vision impairment, programs should be tailored for each individual. For example, adherence could be improved through providing options of home-based or community-delivered programs, visual aids or demonstrations, and accounting for travel concerns. The program should also involve supervised support and motivation in a safe environment to the participant and the program should be sensitive to participants' sense of identity and autonomy. These recommendations are similar to those for the general community (Yardley et al. 2007), but it is likely that barriers relating to travel and support for program delivery are particularly acute for older people with vision impairment.

In summary, results of our qualitative study suggest that although fall prevention programs are effective in preventing falls for older people, there might be unique barriers to participation for those with vision impairment. Furthermore, older people with vision impairment have a range of differing opinions, and thus, it is important to tailor exercise programs to each individual. Prior to this study, minimal investigations into the acceptability of fall prevention programs for older people with vision impairment had been conducted. Consequently, investigations like this provide the first steps in engaging older people with vision impairment in fall prevention programs.

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