

BMJ Open Recipient and instructor perspectives of an adapted exercise-based fall prevention programme for adults aged 50+ years with vision impairment: a qualitative study nested within a randomised controlled trial

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ABSTRACT

Objective Older adults with vision impairment currently have no access to tailored fall prevention programmes. Therefore, the purpose of this study, nested within an ongoing randomised controlled trial (RCT), is to document the adaptation of an existing fall prevention programme and investigate the perspectives of instructors involved in delivery and the older adults with vision impairment receiving the programme (recipients).

Design We documented programme adaptations and training requirements, and conducted semistructured, individual interviews with both the instructors and the recipients of the programme from 2017 to 2019. The content of each interview was analysed using behaviour change theory through deductive qualitative analysis.

Setting New South Wales and Australian Capital Territory, Australia.

Participants The 11 trained instructors interviewed were employees of a vision rehabilitation organisation and had delivered at least one programme session as part of the RCT. The 154 recipients interviewed were community-dwelling adults aged ≥50 years with vision impairment and no diagnosis of dementia, and had completed their participation in the programme as part of the intervention group of the RCT.

Results Six key themes were identified relating to recipient (delivery aptitude, social norms, habit formation) and instructor (individualised adaptation, complimentary to scope of practice, challenges to delivery) perspectives. With initial training, instructors required minimal ongoing support to deliver the programme and made dynamic adaptations to suit the individual circumstances of each recipient, but cited challenges delivering the number of programme activities required. Recipient perspectives varied; however, most appreciated the delivery of the programme by instructors who understood the impact of vision impairment.

Conclusions and implications This novel qualitative study demonstrates that the adapted programme, delivered by instructors, who already have expertise delivering individualised programmes to older people with

Strengths and limitations of this study

- The study is an indepth investigation of the perspectives of both those receiving and those delivering a novel fall prevention programme.
- Applicability to real-world service delivery was enhanced through integration of this investigation within existing service provision.
- Semistructured interview questions may not have elicited specific feedback regarding adaption of the programme.
- Participants were recruited from one community organisation in New South Wales and Australian Capital Territory, Australia, which may limit the generalisability of the findings.

vision impairment, may fill the gap for a fall prevention programme in this population.

Trial registration number ACTRN12616001186448.

BACKGROUND

In Australia, the population of people aged ≥65 years is projected to increase from 14% in 2012 to 18.3%–19.4% in 2031.¹ Over 80% of injury-related hospital admissions of people ≥65 years are a result of falls, representing the leading cause of injury-related morbidity and mortality in older Australians.² Older adults with vision impairment (inclusive of low vision and blindness) experience deteriorated postural stability at a younger age (<60 years)³ and have higher risk of falls and fall-related injuries, compared with their sighted peers.^{4 5} A recent systematic review showed that exercise programmes can reduce falls by up to 39% in high-risk populations when programmes include 3+ hours of exercise per week and focus on balance.⁶ To date, however,

exercise-based fall prevention programmes have not been shown to reduce falls in adults aged ≥ 50 years with vision impairment.⁷ Low adherence of those with vision impairment to programme activities has been cited as a possible reason for this lack of benefit.⁸

The Lifestyle-integrated Functional Exercise (LiFE) programme aims to enhance adherence through requiring participants to integrate strength and balance activities into their everyday routines.^{9,10} The programme has been shown to decrease falls by 31% in community-dwelling older adults.⁹ Following pilot testing in adults ≥ 50 years with vision impairment,¹¹ an adapted programme for this population (v-LiFE) was proposed for evaluation in a randomised controlled trial (RCT) in New South Wales (NSW) and the Australian Capital Territory (ACT), Australia. The programme was delivered by orientation and mobility specialists (instructors) from a community organisation (Guide Dogs NSW/ACT),¹² with experience delivering individualised programmes that enhance safe, confident and independent travel of people with vision impairment in their home or community environment.¹³

Evidence-based interventions are frequently adapted for different populations, but these adaptations are not always well documented.¹⁴ It is critical to document adaptations in order to understand the impact they may have on trial findings when programmes are evaluated for effectiveness.¹⁵ Further, little is known about the perspectives of instructors delivering fall prevention programmes to their clients, as these programmes are usually outside instructors' scope of practice.¹⁶ Similar professions (eg, occupational therapy) routinely investigate professionals' perspectives to inform clinical practice as part of their evidence-based models.¹⁷ The purpose of this study was to document the adaptation and implementation of the v-LiFE programme from the perspectives of instructors involved in delivery, as well as the older adults with vision impairment receiving the programme.

METHODS

The purpose of this study was addressed through a range of data sources:

- ▶ Documenting initial and ongoing adaptations of LiFE for older adults with vision impairment (v-LiFE).
- ▶ Documenting the level of training and support required by instructors to deliver v-LiFE.
- ▶ Semistructured interviews with recipients following completion of the v-LiFE programme.
- ▶ Semistructured interviews with instructors delivering v-LiFE.

The behaviour change wheel (figure 1) intervention functions (middle wheel) and the Capability, Opportunity, Motivation and Behaviour (COM-B) model (inner wheel) were used as the framework to implement and evaluate programme delivery. This framework was chosen due to its emphasis on how specific intervention elements can affect individual behaviour change.¹⁸ Specific intervention functions related to this investigation included

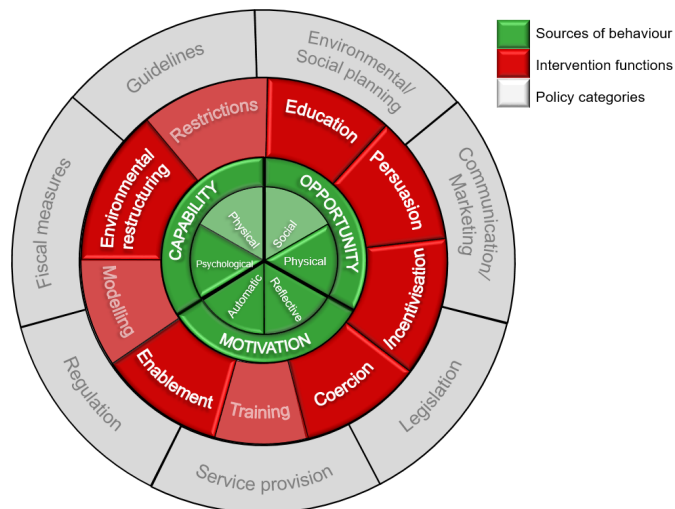


Figure 1 Behaviour change wheel (adapted from Michie *et al*¹⁸) with highlighted components identified in the present study.

*enablement, environmental restructuring, education, persuasion, incentivisation and coercion.*¹⁸

Participants

Older adults with vision impairment

Older adults with vision impairment were recruited from the intervention group of an RCT.¹² Eligible participants were community-dwelling adults ≥ 50 years with vision impairment severe enough to interfere with daily living and with no diagnosis of dementia. Study participants were recruited from Guide Dogs NSW/ACT, and are considered 'clients', as they receive client-centred rehabilitation services from the organisation to enhance independence and mobility, rather than a 'patient' receiving treatment for a vision condition. Although clients are not required to meet specific visual acuity criteria to be eligible to receive services, the majority of clients are blind (characterised as 6/60 or worse vision), while the remaining have low vision (characterised as between 6/18 and 6/60), which grouped together represent vision impairment.¹²

Orientation and mobility specialists (instructors)

Instructors were all trained in v-LiFE and employees of Guide Dogs NSW/ACT. Instructors who participated had delivered at least one v-LiFE programme session to an older adult with vision impairment.

Programme

The original LiFE programme was designed using habit formation theory.^{9,10} The programme uses especially designed self-monitoring tools (activity planner and activity counter) to reinforce activity completion. Consistent with the original LiFE programme, v-LiFE recipients were given a participant manual, which included descriptions of the strength and balance activities, examples of opportunities to practise, and case studies. The programme was delivered in participants' homes on an

individual basis over 5 weekly sessions, followed by two booster sessions and two phone calls, over a period of approximately 3–5 months.

Training the orientation and mobility specialists (instructors)

Instructors were trained in the v-LiFE programme in a 2-day workshop (approximately 9 hours), by the designer of LiFE (LC) and a physiotherapist involved in programme development. The workshop included education regarding the mechanism of falls, the conceptual basis for the v-LiFE programme, and practical training in delivery of programme activities and use of programme materials. Instructors received ongoing support from the physiotherapist and an experienced colleague (LD). Uptake of email, phone and inperson support was recorded.

Older adults with vision impairment perspectives

After completion of the v-LiFE programme, recipients were invited to complete a postintervention individual semistructured telephone interview with an independent researcher (HN). This researcher was a female medical science graduate who received initial training and ongoing support from two experienced female public health qualitative researchers (LD, LK). Due to the broad eligibility criteria used in the RCT, particularly in terms of age (≥ 50 years), it was decided that all consenting recipients would be invited for interview to ensure data saturation and maximise generalisability of findings.

Recipient attitudes to v-LiFE were measured using an open-ended version of the Attitudes to Falls-Related Interventions Scale (AFRIS), which is based on the widely accepted theory of planned behaviour.¹⁹ Open-ended AFRIS questions included the following: ‘Describe how you found doing the v-LiFE program? Easy/hard? Enjoyable?’ and ‘Did you think the v-LiFE program was good for you? How?’ (online supplemental file 1).

Orientation and mobility specialist (instructor) perspectives

Instructor perspectives were investigated through individual semistructured telephone interviews. The experienced colleague (LD), who was also an orientation and mobility specialist and female public health researcher with postgraduate training in qualitative research, conducted these interviews. This interviewer had experience delivering the programme, and it was therefore anticipated that each interview would more deeply explore instructor perspectives. Further, due to instructors’ competing professional priorities, it was decided that initially a random sample of 20 instructors would be invited for interview.

Interviews explored facilitators and challenges to programme delivery, as well as suggestions for further adaptation of v-LiFE. Examples of questions included the following: ‘What were the main challenges you experienced when delivering the program?’ and ‘What about v-LiFE could be adapted to help [Instructors] deliver the program?’ (online supplemental file 2). Since previous studies have shown low adherence of older adults with

vision impairment to exercise-based fall prevention programmes,⁸ questions were asked about reducing barriers and increasing delivery of the v-LiFE programme to older adults with vision impairment.

In line with Saunders *et al*²⁰ the data for both the recipients and the instructors were considered saturated when no additional, relevant outcomes were generated. This was discussed and decided at regular project meetings by researchers (LD, HN, LK). Each interview was audio-recorded and transcribed verbatim. Transcripts were not returned to participants for comment or correction, nor were repeat interviews conducted.

Patient and public involvement

There were no funds or time allocated for patient and public involvement so we were unable to involve older adults with vision impairment. We have invited older adults with vision impairment to help us develop our dissemination strategy.

Data analysis

Transcripts of the semistructured interviews from recipients and instructors were analysed using QSR International NVivo V.11 qualitative data analysis software. Using deductive analysis,²¹ transcripts were coded by a researcher (LD) within the intervention functions and sources of behaviour from the behaviour change wheel, and checked for accuracy and clarity by a second researcher (LK). Illustrative quotes from recipients are included with their sex (male or female) and age, and from instructors with their sex (male or female), years of experience and number of recipients they delivered v-LiFE to. This study is reported in line with the Consolidated criteria for Reporting Qualitative research.²²

RESULTS

Adaptation of v-LiFE

Initial adaptations

The participant manual was modified into large print, electronic (PDF) and audio (CD) versions to suit a variety of vision conditions and preferences for accessing information.¹² The manual was also updated to shorten text, and case studies replaced with examples of people with vision impairment.¹¹ The activity planner and activity counter were modified into large print, extra-large print and electronic (PDF) versions.

Previous pilot testing¹¹ revealed that the standard number of sessions for LiFE was insufficient to adequately train some of the participants in all programme activities. Instructors were given the option to include an additional two sessions, if required. This was negotiated between the instructors and the recipients, in line with usual individually tailored orientation and mobility service delivery.

Ongoing adaptations

Through interviews, instructors reported having tailored the programme to recipients’ preferences (such as where

Table 1 Adaptations to the v-LiFE programme as reported by orientation and mobility specialists (instructors)

Adaptations	Specific adaptations
Physical	Adapted programme activities for comorbidities and injuries using performance in the v-LiFE Assessment Tool, professional judgement and advice from the physiotherapist LiFE trainer.
Programme materials	Participant manual: large text, audio, PDF. Recording devices: large text activity planner and activity counter, word processing software document, spreadsheets, voice recorder, beads, counters in a box, calendar. v-LiFE Assessment Tool: used at the start to guide level of activities, but also used at the end to reinforce progress.
Activity frequency	Routine-based (as per LiFE) or allowed LiFE activities to be completed as a block if the participant is not able to complete activities throughout the day.
Number of sessions	Additional sessions for older participants, those with health issues or those having trouble remembering activities. Fewer sessions (which still enable habit formation of programme activities) for younger participants, those without health issues or those who implemented activities quickly.
Prompts to perform activities	Home item prompts (such as a tissue box out of place, or a toothbrush placed in a lower drawer). Prompts specific to those with low vision: coloured/big markers/stickers. Prompts specific to those who are blind: tactile markers (such as embossed stickers).
Family	Family assisted in recording and monitoring completion of activities.

v-LiFE, Lifestyle-integrated Functional Exercise programme for people with vision impairment.

or how often they liked to exercise), home environment and health status, and encouraged recipients to use whatever method of recording activity completion they were already familiar with using. [Table 1](#) shows specific adaptations reported by instructors.

Training and support required for orientation and mobility specialists (instructors) to deliver v-LiFE

Seventy-three instructors received training in the v-LiFE programme. Of these, 51 (69.9%) delivered at least one session to participants between March 2017 and April 2019 ([table 2](#)). Of these 51 instructors, the abovementioned physiotherapist who was available for technical advice and support provided phone support to 7 (13.7%) and email support to 2 (3.9%) instructors. On instructor

Table 2 Support provided to orientation and mobility specialists (instructors) by the physiotherapist and experienced colleague

Trained instructors (n=73)	
Instructors delivered v-LiFE, n (%)	51 (69.9)
Physiotherapist support, n (%)	
Observed session	0 (0)
Phone	7 (13.7)
Email	2 (3.9)
Colleague support, n (%)	
Observed session	2 (3.9)
Phone	14 (27.5)
Email	12 (23.5)

v-LiFE, Lifestyle-integrated Functional Exercise programme for people with vision impairment.

request, the experienced colleague attended sessions with 2 (3.9%) instructors and provided phone support to 14 (27.5%) and email support to 12 (23.5%) instructors.

Participants

Older adults with vision impairment

Of the RCT participants randomised to receive v-LiFE, the 172 participants who had finished the programme at the time of this investigation and were therefore eligible for a postintervention interview were contacted by phone between March 2017 and April 2019. Of these, 3 were unreachable or declined interview and 15 had withdrawn from the study. Interviews took approximately 15 min and were ceased at 154 interviews, and no more participants were invited after this point due to thematic saturation. [Table 3](#) shows the demographic characteristics of the 154 v-LiFE recipients who completed the postintervention interview.

Most recipients were overweight or obese (105 of 154, 68%; mean body mass index 28.4 kg/m², SD 6.0 kg/m²), female (92 of 154, 60%), and with high school or above education (147 of 154, 96%). Recipients were on average 73.2 years of age (SD 10.2 years). The most common vision conditions were age-related macular degeneration (48 of 154, 31%), glaucoma (31 of 154, 20%) and retinitis pigmentosa (27 of 154, 18%).

Orientation and mobility specialists (instructors)

Twenty instructors were invited to participate in an interview between June and August 2018; of these, eight were unreachable and one declined following initial interest. Interviews with instructors took approximately 40 min, which were much more in depth than interviews with recipients. Consequently, thematic saturation occurred

Table 3 Demographic characteristics of older adults with vision impairment (n=154)

Demographic characteristics	n=154
Age in years (range: 52–92), mean (SD)	73.2 (10.2)
Female, n (%)	92 (59.7)
Living status, n (%)	
Live alone	66 (42.9)
Spouse only	60 (39.0)
Spouse and children	15 (9.7)
Relatives/children	11 (7.1)
Other	2 (0.0)
Education, n (%)	
Beyond high school	79 (51.6)
High school	68 (44.4)
Primary school	6 (3.9)
Body mass index (kg/m ²), mean (SD)	28.4 (6.0)
Comorbidities, n, mean (SD)	6.6 (3.5)
Legally blind, n (%)	134 (87.0)
Visual acuity (logMAR), mean (SD)	1.3 (1.0)
Contrast sensitivity, mean (SD)	0.9 (0.7)
Visual field defect, n (%)	85 (55.2)
Vision conditions, n (%)	
Age-related macular degeneration	48 (31.2)
Glaucoma	31 (20.1)
Retinitis pigmentosa	27 (17.5)
Cataract	22 (14.3)
Stroke/head injury	17 (11.0)
Diabetic retinopathy	5 (3.3)
Don't know/other	75 (48.7)
Number of vision conditions, n (%)	
1	103 (66.9)
2	35 (22.7)
3	13 (8.4)
4	2 (1.3)
5	1 (0.6)

logMAR, logarithm of the minimum angle of resolution.

much earlier and interviews ceased after 11 interviews, and no more instructors were invited after this point. [Table 4](#) shows the characteristics of the 11 instructors who completed the interview.

The majority of instructors were female (9 of 11, 82%) and delivered services in a metropolitan area (8 of 11, 73%). On average, instructors had worked in their role for 9.1 years (SD 5.6 years) and delivered the programme to between 1 and 16 participants (mean 5.9, SD 4.5) at the time of interview.

Semistructured interviews

Identified themes from the interviews and associated illustrative quotes are summarised in [table 5](#). Overall,

Table 4 Characteristics of the sample of orientation and mobility specialists (instructors) interviewed (n=11)

Instructor	Gender	Years in role	Metropolitan/ regional	Older adults with vision impairment trained in v-LiFE, n
1	F	17	Metro	10
2	F	4	Metro	3
3	F	2	Regional	16
4	M	10	Metro	8
5	F	9	Metro	6
6	F	8	Metro	4
7	M	8	Metro	2
8	F	9	Regional	6
9	F	2	Regional	8
10	F	11	Metro	1
11	F	20	Metro	1

F, female; M, male; v-LiFE, Lifestyle-integrated Functional Exercise programme for people with vision impairment.

recipients were able to access and engage with the programme. However, the programme was considered too easy for younger recipients or those already undertaking physical activity or exercise. Instructors generally enjoyed delivering the programme and saw it as an extension of their work. Although criticism was scarce, there was some criticism of the high number of activities and difficulty in recording activities for a wide range of participants with different levels of vision or ability to use technology.

Older adults with vision impairment perspectives

Delivery aptitude

Although not explicitly asked, delivery by instructors was well regarded based on a perceived good understanding of how vision influences mobility and the need to adapt activities accordingly. Recipients also appreciated the regular one-on-one sessions in their home and found the programme pace well suited to them.

Social norms

Recipients reported that they would recommend the programme to someone like themselves, including those with or without vision impairment, particularly because the programme is individualised and aims to improve strength and balance. Recipients who said they would not recommend the programme to someone like themselves were usually younger (≤ 65 years) and stated the programme would be more appropriate for someone older or less mobile.

Habit formation

Embedding v-LiFE activities into daily routines and doing the activities in sets were both reported. For most, embedding was the preferred method. This aligns with habit formation theory, whereby behaviours are repeated

Table 5 Identified themes from semistructured interviews with older adults with vision impairment (recipients) and orientation and mobility specialists (instructors), and the behaviour change wheel components

Themes	Quotes	Behaviour change wheel component	
		Intervention functions	Sources of behaviour (subset)
Recipient perspectives			
Delivery aptitude	<p>“Instructors were helpful, making it enjoyable.” (F, 80)</p> <p>“...Instructors are very aware of the vision impairments we have.” (M, 70)</p> <p>“I found it enjoyable, especially speaking to the... instructor and how I can improve.” (F, 72)</p>	Enablement	Opportunity (physical)
Social norms	<p>“Yes, [I would recommend it] to anyone with vision problems and balance issues. Particularly those with a cane.” (M, 72)</p> <p>“I would recommend it to anyone in fact. There’s great value in that. Everyone could benefit from increasing their balance and strength, and those with vision impairment.” (F, 66)</p> <p>“I think it would be better suited to more elderly people and less active people.” (F, 59)</p> <p>“Not really but this is mostly likely because I am young and still active. These exercises seem more suitable for older adults and those who are not as active or have really bad vision or other disabilities.” (F, 61)</p>	<p>Education, persuasion, incentivisation and coercion</p> <p>Education, training and enablement</p>	<p>Motivation (reflective)</p> <p>Capability (psychological)</p>
Habit formation	<p>“(I) have modified the way I (do) daily activities: hanging clothes on line with a sideways steps, tandem walk while waiting for toast.” (M, 68)</p> <p>“I didn’t like the daily activity ones and didn’t have time for them so instead [the Instructor] and I set them up to do them all in sets together.” (M, 68)</p>	Environmental restructuring and enablement	<p>Opportunity (physical)</p> <p>Motivation (automatic)</p>
Instructor perspectives			
Individualised adaptations	<p>“I guess it’s like what we do in O&M...it’s second nature...I modify everything for every person. Because the technique is still the same but the instructions have to change or the environment has to change.” (F, 17 years, 10 older adults with vision impairment)</p> <p>“I’d go through that first assessment to see what they could do and then if I felt that they could do a little less of that level, but with some kind of considerable modification I would try that with them, but I’d let them tend to guide me.” (F, 2 years, 16 older adults with vision impairment)</p>	Environmental restructuring and enablement	Opportunity (physical)
Complimentary to scope of practice	<p>“I just enjoyed the program as a whole; teaching them [older adults with vision impairment] the activities that helped improve their strength and balance and just seeing how much of an improvement it makes to them over the course of time.” (F, 8 years, 5 older adults with vision impairment)</p> <p>“I thought the booklets and how it was all done there for you; you didn’t really have to think about it, you just did it. You just followed the step-by-step and followed the structure and you can change and you can modify as you go.” (F, 17 years, 10 older adults with vision impairment)</p>	Incentivisation	Motivation (automatic)

Continued

Table 5 Continued

Themes	Quotes	Behaviour change wheel component	
		Intervention functions	Sources of behaviour (subset)
Challenges to delivery	<p>“I found it difficult embedding the number of activities into some of everyday routines, especially with older clients. It can be difficult for them to remember even a few activities. Yes, there are ways to document or record the activities or the routines that it was embedded into, but again, because there’s so many it just can be difficult to keep track for clients.” (F, 4 years, 3 older adults with vision impairment)</p> <p>“I’ve had a couple that were not computer savvy either or didn’t have any text to speech so it’s just been [challenging] how they record it and how they remember to do the activities.” (F, 8 years, 4 older adults with vision impairment)</p>	Enablement and environmental restructuring	Opportunity (physical)

F, female; M, male; O&M, orientation and mobility.

in response to contextual cues, until which point they become automatic.²³ However, some recipients preferred to modify the programme so that activities were done together rather than throughout the day, often because of time constraints or preference for a more traditional set-based exercise programme.

Orientation and mobility specialist (instructor) perspectives *Individualised adaptations*

Number of sessions

Views were divided among instructors about whether they should modify programme length for each participant or not. For those who did not, it was usually due to concern about deviating from the research protocol. All instructors reported that if the programme was rolled out as part of usual service delivery in the future, they would vary session number based on recipients’ preferences, home environment and health status.

Programme materials

Typically, recipients’ level of vision had the most impact on whether materials were used and/or modified. For those with functional vision, the activity planner and activity counter were used to record activity completion. For those with low vision, the planner and counter were modified with less text/increased font size. For those with no functional vision, tactile markers were used to aid or replace the activity planner or counter. Other technologies, such as voice recorders or electronic documents, were used for some. For those who lived with others, a family member often assisted with completing the activity planner and counter.

Complementary to scope of practice

All instructors interviewed reported feeling comfortable and supportive delivering the v-LiFE programme to older adults with vision impairment. The benefits experienced

by recipients during the programme were particularly motivating, and the clear structure of the programme was appreciated by the instructors. Conversely, instructors reported that other work priorities, such as travel and data collection for the RCT, were external barriers to delivering the programme.

Challenges to delivery

Although reported challenges were scarce, instructors noted two main challenges when delivering the v-LiFE programme to older adults with vision impairment. First, instructors considered it challenging to teach and embed all of the programme activities into recipients’ daily routine, particularly with those who were older or with cognitive issues. The second related to recording activities; although there were many options to record activities, there were instances where instructors had difficulty finding a method appropriate to the recipient’s vision, memory or technological ability.

DISCUSSION

The perspectives of instructors and older people with vision impairment to an adapted exercise-based fall prevention programme, v-LiFE, were investigated. Findings suggest that v-LiFE can be successfully delivered to older adults with vision impairment, with instructors requiring minimal ongoing training and support. Instructors were adept at making dynamic adaptations to the v-LiFE programme, individualised to the circumstances and motivators of each recipient.

Environmental restructuring and *enablement* were found to be particularly instrumental to the positive attitudes of recipients and instructors in the delivery of the v-LiFE programme. Environmental restructuring and enablement facilitate behaviour change through changing the physical or social context, and increasing means and



reducing barriers, respectively.¹⁸ People are often unable to participate in fall prevention programmes due to competing priorities as well as travel concerns,^{19,24} particularly those with vision impairment who may have additional mobility issues.²⁵ These barriers were alleviated through delivery of the v-LiFE programme in the home and tailoring the mode of activity completion. Also, the programme was delivered by professionals with expertise delivering individualised programmes to people with vision impairment, further improving recipients' opportunity (a source of behaviour) to participate in the programme.

A motivational barrier for younger (≤ 65 years) or more active recipients was their perception that they were not at risk of falling. Elskamp *et al*²⁴ similarly found that younger and more active participants consider themselves 'too healthy' to participate in a fall prevention programme, despite having presented to an emergency department due to a fall. These findings are consistent with other studies,¹⁹ as well as those targeted at older adults with vision impairment,²⁵ which found that people do not consider themselves at risk of falls because of associated negative connotations. Although older people with vision impairment experience reduced postural stability at a younger age³ and are at a higher risk of falls,^{4,5} it is likely our participants agreed to participate in a fall prevention trial because of their pre-existing relationship with the organisation delivering the programme.¹¹ The younger and more active participants reported not being overly challenged by programme activities. In a small feasibility study, Schwenk *et al*²⁶ adapted LiFE for younger seniors (60–70 years; aLiFE) with the inclusion of enhanced balance and strength activities targeting agility and sedentariness. Similar adaptations to v-LiFE could be investigated to improve the motivation of younger, more active people, with vision impairment.

Strengths and limitations

Strengths of this study are the indepth investigation of the perspectives of both receivers and deliverers of a novel programme, and a rigorous analysis process using an accepted theoretical framework. However, a limitation is that the questions asked of recipients may not have been adequate in eliciting responses based on the adaptation of the programme for people with vision impairment. For example, the independent researcher who conducted these interviews noted that recipients found it challenging to answer the question regarding 'unexpected outcomes'. By using a researcher who was not involved in the delivery of the programme, we may have reduced some bias in recipient responses. However, they may have also lacked the experience to deeply explore how programme adaptations influenced programme completion and sustainability, which would benefit further adaptation of the programme. This also may explain the relatively short length of interviews with recipients compared with instructors (15 vs 40 min). Further, this study was being delivered by personnel of

a highly respected organisation, so recipients may not have felt confident being critical about programme delivery. Additionally, duration of time with vision impairment was not collected from participants, nor were data stratified by age, which may have been valuable in interpreting the qualitative data. Last, instructors spend most of their time engaged in client work, including travelling between clients across NSW and ACT, and are therefore generally time-poor. The instructors who made time and accepted the invitation to interview were likely interested in fall prevention or positive about the programme, and perspectives of those who did not enjoy delivering the programme may not have been accounted for.

CONCLUSION

Delivery of fall prevention programmes by orientation and mobility specialists may fill the gap in programme delivery for people with vision impairment, as this study demonstrated successful delivery with training and modest ongoing support. Effectiveness of the programme in this population as a means to prevent falls is forthcoming, following completion of the RCT.¹² Further, a mixed methods process evaluation of the RCT examining relationships between programme outcomes and quality of intervention implementation is planned. This will include fidelity of delivery, number of sessions required, and associations between participants' demographic, functional, clinical and visual function characteristics with participants' receipt and enactment of programme activities.²⁷ The current study has the potential to inform developers of exercise programmes for the prevention of falls in older adults with vision impairment or those looking to include people with vision impairment into existing programmes. This includes eligibility criteria, particularly in terms of what age range or physical ability would suit the programme in its current form. This study provides practical suggestions for delivery, through documenting initial and ongoing adaptations, and gives a true sense of how this programme works within dynamic, real-world service delivery. Perspectives of instructors and older adults with vision impairment are critical to the ongoing development of pragmatic and accessible fall prevention programmes which can be delivered at scale.

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Contributors LD was responsible for the conception, design, data collection and data analysis, and was the major contributor to writing the manuscript. LK contributed to conception, design and data analysis. HN contributed to qualitative

data collection and interpretation of findings. FT, JM and KBJ contributed to conception and design. LC contributed to design and interpretation of findings. All authors read and approved the final manuscript.

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Competing interests None declared.

Patient consent for publication Not required.

Ethics approval Ethics approval for the larger RCT and postintervention interviews with recipients was granted by the University of Sydney Human Research Ethics Committee (2016/787); all recipients were informed of the objectives, methods and procedures of data collection. Their rights to confidentiality, anonymity and voluntary withdrawal from study participation were explained and assured. Written informed consent to participate was obtained from all recipients at the commencement of their participation in the RCT. Recipients were approached by a researcher (HN) via telephone once they completed the v-LiFE programme. Ethics approval for the semistructured interviews with instructors was granted by the University of New South Wales Human Research Ethics Committee (HC180362). Instructors were approached via email and follow-up phone call by a researcher (LD). Their rights to confidentiality, anonymity and voluntary withdrawal from study participation were explained and assured. Verbal informed consent to participate was obtained from all participants.

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Data availability statement Data are available upon reasonable request.

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