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2 Running head: *Physical Activity in Older People with Sight Loss*

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4 **Exploring the facilitators and barriers to physical activity in older people**

5 **with sight loss**

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1 **ABSTRACT**

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3 This study aimed to explore facilitators and barriers to physical activity in
4 older people with sight loss. Focus groups were conducted with 13
5 community dwelling older adults with sight loss ranging from poor to
6 completely blind. Transcripts were analysed using an inductive thematic
7 analysis. Facilitators and barriers are experienced in three ways:
8 psychologically; through opportunity and access; and at a societal and
9 policy level. Campaigns are needed to challenge unhelpful age-related
10 stereotypes at both psychological and societal levels. Additionally,
11 interventions grounded in evidence and theory should be trialled and
12 evaluated for increasing physical activity in this population.

13 **Keywords:** physical activity; ageing; older people; vision loss

14

1 **Main Text**

2 Physical health status plays a critical role in ability to fulfil daily living activities,
3 therefore physical health rehabilitation is recommended for older adults to enhance
4 muscle strength, cardiovascular fitness and reduce levels of functional limitation
5 (Lamoureux, Hassell, & Keeffe, 2004). However, physical inactivity is common in
6 older adults (Shankar, McMunn, & Steptoe, 2010) particularly those with sight loss
7 (Alma et al., 2011; Willis, Jefferys, Vitale, & Ramulu, 2012).

8 Increases in sight loss severity lead to decreases in activity levels even when
9 other health-related factors are controlled (Swanson, Bodner, Sawyer, & Allman, 2012),
10 illustrating a need to explore the specific contributions of sight loss to physical activity
11 reduction. Recently, Phoenix, Griffin, and Smith (2015) proposed that barriers are
12 located within the social worlds of older adults with sight loss and include: the
13 environment; organisational opportunities; transport; information; confidence; fear and
14 personal safety; and perceptions of exercise as medicine. The authors outline
15 recommendations for changes to health policy including: increased accessibility of
16 social spaces and improved transport options; promotion of compliance with anti-
17 discrimination laws; increased opportunities and improved information regarding
18 participation; and collaboration between service providers and charity organisations.

19 However, psychological factors important to behaviour change are not
20 discussed in-depth by Phoenix et al., and concrete recommendations for how
21 behavioural science might be used to design interventions to overcome psychological
22 barriers within this population are needed. For example, psychological barriers such as
23 self-efficacy; the belief in the capacity to engage in a behaviour (Bandura, 1997); is an
24 important factor in the uptake and maintenance of physical activity (Ashford, Edmunds,
25 & French, 2010). For older adults with sight loss, fear of mobilising outdoors and

1 reduced confidence in walking abilities may reduce self-efficacy beliefs (Rudman &
2 Durdle, 2009), resulting in additional barriers to engaging in physical activity
3 interventions which could be perceived by older adults to increase fall risk (Campbell et
4 al., 2005).

5 These psychological support needs are frequently overlooked within United
6 Kingdom (UK) based sight loss services, which include: high street opticians, National
7 Health Service (NHS) ophthalmology clinics and third sector organisations (Burton,
8 Shaw, & Gibson, 2013). The Adult UK Eye Health and Sight Loss Pathway (Vision
9 2020, 2015) clarifies best practice principles for health and social care service
10 collaboration to achieve independent living outcomes (including mobility and physical
11 activity) and promote autonomy, independence, health and wellbeing in people with
12 sight loss. The main focus of this pathway is medical and functional assessment and
13 intervention, with little reference to psychological needs. While emotional support is
14 highlighted as the role of Eye Clinic Liaison Officers (ECLOs), Hospital Information
15 Officers and Vision Support Services or similar qualified to the level of Certificate in
16 Eye Clinic Support Studies (the ambiguity here reflecting the variation in rehabilitation
17 models used across the UK), these services simply provide signposting to and guidance
18 on psychological services rather than intervention. This approach fails to consider early
19 assessment of psychological barriers to physical activity requiring intervention before
20 decreases in engagement occur. These psychological barriers must be explored and
21 understood to enhance the psychological support offered within the pathway and devise
22 appropriate interventions.

23 Interventions to increase physical activity in this group are sparse. According to
24 a recent Cochrane Review, no randomised controlled trials or quasi-randomised
25 controlled trials of interventions with outcome measures gauging effectiveness on

1 physical activity or quality of life for older people with sight loss have been conducted
2 (Skelton et al., 2013). However, the limited evidence available suggests that opportunity
3 to be involved in organised, supportive community walking activities may help to
4 increase physical activity and social engagement (Green & Miyahara, 2008).
5 Additionally, group led exercise classes relying on verbal and tactical cues for
6 movement (e.g. Tai Chi) (Chen, Fu, Chan, & Tsang, 2012; Miszko, Ramsey, & Blasch,
7 2004), and dance and balance programmes (Hackney, Hall, Echt, & Wolf, 2015) have
8 also been reported as both safe and beneficial. Yet reasons for these successes, the
9 impacts of these interventions on psychological factors, and how participants overcome
10 barriers to engaging in physical activity is currently unknown.

11 Rather than withdrawing, older people with sight loss express a desire and
12 motivation for continued engagement in personally meaningful activities (Stevens-
13 Ratchford & Krause, 2004) yet minimal research has reported on the nature of such
14 activities or the barriers and facilitators towards participation. We aimed to further
15 explore this gap in the literature and to expand on the findings of Phoenix et al. (2015)
16 by exploring psychological factors, in addition to social and environmental factors,
17 relevant for interventions to increase physical activity levels in older people with sight
18 loss. To achieve this aim three main research questions were set: (1) What forms of
19 physical activity are older people with sight loss currently engaged in? (2) What are the
20 barriers to engaging in physical activity for this group? (3) What are the facilitators to
21 engagement?

22 **Method**

23 *Ethics and consent*

24 University ethical approval was granted for this research. Written consent was obtained

1 from all participants.

2 ***Participant selection***

3 English speaking older adults (65+) were recruited from West Midlands-based
4 community groups for older people with sight loss. Group leaders were identified
5 through internet searches and emailed project information. If group leaders agreed, a
6 first meeting was arranged to introduce the research and distribute information sheets.
7 These were read aloud to participants if requested. A second meeting was arranged for
8 data collection with consenting participants. Non-consenting group members were made
9 aware (via the group leader) when data collection would take place and on those days
10 completed usual group activities in another room.

11 Participants provided data relating to their age, gender, then cause and diagnosis
12 of vision impairment (if known). Self-reported level of impairment severity was
13 recorded using a single item taken from the National Eye Institute Visual Functioning
14 Questionnaire (Mangione et al., 2001); “At the present time, would you say your
15 eyesight using both eyes with glasses or contact lenses, if you wear them, is: excellent,
16 good, fair, poor, very poor or are you completely blind?”.

17 The sample included 13 older adults (seven male, six female) aged 73-94 years
18 (Mean: 83, SD: 6.72). A range of sight loss causes were reported with nine participants
19 having some form of macular degeneration and 10 participants with both eyes affected.
20 Self-reported severity of sight loss ranged from good to completely blind with the
21 majority reporting poor or very poor sight. Characteristics for each participant can be
22 seen in table 1.

23 INSERT TABLE 1 HERE

1 *Analysis process*

2 The focus groups were audio-recorded, transcribed by the third author and then checked
3 for accuracy by the first author. All identifying information was removed from the
4 transcripts and participants chose their own pseudonyms.

5 Data were subjected to a descriptive inductive thematic analysis (Braun & Clarke,
6 2013). Thematic analysis is a flexible technique that aims to identify patterns of
7 meaning within data (Braun & Clarke, 2006). The aim of inductive thematic analysis is
8 to stay close to the data and derive and develop themes grounded in participant
9 experience rather than existing theory (Clarke, Braun, & Hayfield, 2015). Braun and
10 Clarke (2013) propose six stages of thematic analysis: familiarisation, generating initial
11 codes, searching for themes, reviewing themes, defining and naming themes, and
12 producing the report.

13 Familiarisation, initial coding and searching for themes were conducted independently
14 by the first two authors. This involved in-depth reading and re-reading of the transcripts
15 followed by paying close attention to small sections or 'meaning units' (Langdridge,
16 2007) in turn. Open coding was employed to give each meaning unit an analytical code.
17 Initial codes were then reviewed alongside the full text and grouped into border theme
18 titles that theorised the facilitators and barriers to physical activity.

19 Further theme definition and development was achieved through a cyclical process
20 (Shin, Kim, & Chung, 2009) with constant comparison between the data and developing
21 theme titles. This process took place through regular team analysis meetings in which
22 the first and second author compared individually-derived themes and subthemes.

23 Where differences were evident the team returned to the full text and discussed the
24 differences with the third author. Differences tended to be in relation to nomenclature

1 rather than meaning and content and therefore the final stage of defining and naming the
2 themes was agreed by all three authors.

3 **Results**

4 Participants were engaged in a range of physical activities with three key forms
5 reported: scheduled clubs or classes including group dance, walking, bowls and golf
6 (e.g. “*We have dancing. Well a form of dancing like Zorba the Greek y’know?*”, Bet,
7 age 80); opportunistic walking with friends and family or to local shops (e.g. “*if my*
8 *buses haven’t come I walk into [town], that’s about a mile*”, Reg, age 94); and activities
9 of daily living such as shopping, dog walking, gardening and housework (e.g. “*[we]*
10 *look after our houses, I mean that’s a physical activity*”, Star, age 83). The facilitators
11 and barriers to these activities were grouped under three main themes: psychological
12 factors, opportunity and access, and societal and environmental factors. Theme
13 definitions and a summary of the key facilitators and barriers highlighted by the
14 participants within each theme can be found in Figure 1.

15 **INSERT FIGURE 1 HERE**

16 *Psychological factors*

17 A desire to remain independent was central to the lives of many participants. Personal
18 attitude and drive to be physically active helped participants overcome some challenges
19 and helped them to achieve independence. For example, Alex held strong perceptions of
20 his capability:

21 *If you have a positive attitude and you think, right I’m gonna do that, that*
22 *drives me forward more than anything. I don’t depend on other people. I’m quite*
23 *independent so I think you have to have quite a positive attitude to do it by*
24 *yourself. (Alex, age 77)*

1 For Alex, and other participants, a positive attitude made it possible to be an
2 independent older person regardless of physical and visual limitations and facilitated
3 engagement in physical activities. Positive attitude and drive for independence were
4 also presented through examples of stoicism which facilitated engagement in physical
5 activity.

6 *My exercise is climbing the stairs about 40 times a day which I do because I*
7 *keep forgetting things so. [...] Sometimes I don't even hold the rail because I*
8 *know them so well. I'll fall one day I know I will [laughs], but I won't give in.*
9 *(Cecilia, age 81)*

10 However, these activities were not without risks and, one accident or fall could be
11 enough to eradicate this psychological facilitator and result in a perception of fear and
12 incapability:

13 *If I thought that a car was coming towards me, I wouldn't know how far away it*
14 *was, and curbs, I'm frightened of tripping up a curb [...] When we had that*
15 *windy weather, I got my foot out of the car and the door blew on my leg and cut*
16 *my leg on my bone. So now [my son will] say "don't get out of that car, until I'm*
17 *round to get you out". (Melissa, age 88)*

18 Incidents involving falls or injuries resulted in increased awareness of environmental
19 barriers to physical activity such as the inability to see hazards or obstacles, which could
20 lead to increased dependence, illustrated in this case by Melissa's son taking
21 responsibility for assisting Melissa out of the car.

22 Negative experiences were not only physical incidents. These experiences could
23 also create psychological barriers such as embarrassment and frustration:

24 *[My wife will] say "try and do some" [gardening] and then she'll start telling*
25 *me off because I'll pick the plants out and not the weeds [laughs]... so you're*
26 *trying to do it and then she pushes you on one side, "it's quicker if I do it on my*

1 *own[...] you laugh at it but it, it's not nice y'know, to be pushed on one side so*
2 *they can do it. (John, age 73)*

3 John's experience highlights the impact of the perceptions of others on feelings of
4 capability and motivation to be physically active. John illustrated frustration,
5 embarrassment and a feeling of belittlement resulting from his wife's reactions and,
6 understandably, fear of similar future incidents influenced John's reduced engagement
7 with gardening. Like Melissa, John's account suggests how family members can,
8 perhaps unwittingly, create environments that facilitate reduced engagement and
9 legitimise reductions in physical activity.

10 Once barriers were experienced and salient, participants could struggle to regain a
11 feeling of capability. This in turn reduces motivation to be physically active (*"I think the*
12 *problem is as well, once you stop, it's getting motivated again"*: Eduardo).

13 Additionally, several participants described lost motivation for physical activity as an
14 expected part of old age:

15 *Whether you would get people motivated again I don't know. I mean when*
16 *you're in your 80s it's a bit difficult to start, you can't, as I say you can't teach*
17 *an old dog new tricks. (Torino, age 94)*

18 For many participants physical activity was perceived as something for younger
19 generations (*'Young adults, rather than 70 or 80 year olds [...] they are the ones that*
20 *really need all of the exercise and can actually do it'*, William, age 89) indicating a lack
21 of awareness of both the benefits of physical activity and recommended physical
22 activity levels for their age group.

23 *Opportunity and access*

24 Barriers were more commonly reported than facilitators when considering opportunities

1 for and access to physical activity environments. There was a perception that locations
2 to engage in desired activities were limited, for example several participants commented
3 on the closure of local community swimming pools:

4 *I would like to [swim] but I, from what I can gather, they don't run the classes,*
5 *the over 50s things any more, they've scrapped them. And they've closed the*
6 *pools (Bet, age 80)*

7 The closure of local services resulted in the need to travel further to access such
8 resources, an issue made more problematic by challenges in navigating outdoor
9 environments. For example, sight loss resulted in many being unable to drive and
10 reliance on public transport or lifts from family members:

11 *I've had to stop driving because I can't see number plates, things like that. I*
12 *can't recognise cars, everything is blurred [...] I find that it's frustrating*
13 *because you used to get in the car, now you've got to rely on somebody else.*
14 *(Joe, age 73)*

15 Participants also highlighted that opportunities for physical activity for older adults with
16 sight loss were limited and a feeling that services were provided for other people and not
17 for them:

18 *"Nothing ever for the blind. Is it because they think we're just stupid? I mean*
19 *there isn't anything is there? You never see any activity published for the blind*
20 *ever." (Cecelia, age 81) "No that's true" (John, age 75)*

21 Some participants were given opportunities to help navigate the outside world,
22 through access to support and equipment. However, use of these resources could be
23 challenging:

24 *I use two sticks when I go walking and I feel it, in front of me all the time.*
25 *Y'know for when I'm on steps, I feel the steps. As I say, normally I have two if I*

1 *go out walking, I have two sticks like this and I'm constantly feeling steps or*
2 *obstacles as I go along. (Eduardo, age 86)*

3 Many participants had strong desires for independence in spite of obstacles, but
4 accounts of the tools provided to increase opportunities and access also illustrated
5 associated challenges. One participant described an intervention which could potentially
6 overcome these barriers. Claire, who had previously been restricting her activities,
7 described an opportunity which led to increased confidence:

8 *I did have cane training ...I used to have a little thin white stick that just said*
9 *that I was blind but [the trainer] came along and she made me feel a lot*
10 *different about using the white stick, she made me go into a shopping centre and*
11 *smell things so that I could recognise where I was and things like that... she*
12 *gave me training with this cane that's got a ball on the end so I swoop it in the*
13 *middle of me, just the width of my body so that if anything comes up, that stick*
14 *will find it [...]* *She trained me to go up steps, she trained me to go on an*
15 *escalator, she gave me a bit more life than I did have. (Claire, age 79)*

16 Claire had become aware of this service through a support group; however, this
17 opportunity was not without its problems: *'I was on the waiting list for two years and*
18 *nobody got in touch with me'* (Claire). Claire was the only participant to have
19 experienced cane training; group discussion suggested that long waiting lists and cuts to
20 service provision meant that others were unlikely to benefit from this opportunity to
21 have in Claire's words: *"a bit more life"*. For Claire, this intervention helped bolster
22 psychological facilitators to physical activity such as perceptions of capability and
23 confidence (*"I think [the cane trainer] was good because she made me realise y'know*
24 *that, don't be stupid staying in the house, get out there"*, Claire).

25 *Society and environment*

26 While some positive environmental changes were highlighted, such as yellow/white

1 stripes painted on stairs and the availability of handrails, the majority of the examples
2 provided illustrated how unfamiliar environments could perpetuate barriers to physical
3 activity engagement.

4 *Along my avenue [...] cars block the pavement completely and I have to walk in*
5 *the road. I daren't do it anymore on my own. Trees overhanging, and they aren't*
6 *all to do with private houses, they're council, and they could blind you if you*
7 *weren't already blind they're hanging that low, but nobody will do anything.*
8 *(Claire, age 79)*

9 Even newly built environments designed with consideration for equality and diversity
10 requirements presented challenges:

11 *The new bus station [...] that's supposed to be for the blind [...] they're*
12 *supposed to have somebody there to tell them [how to design it]. But I can't go*
13 *[to town] now because where the letters are; A, B, C, D or whatever, they aren't*
14 *at eye level or even where you could go and feel the letter. They're way up in the*
15 *air. (Claire, age 79)*

16 Additionally, accounts highlighted several daily experiences which illustrated a lack of
17 awareness of the needs of people with sight loss:

18 *'When you go up town and all the shops have got their boards out on the*
19 *pavements... and tables and chairs out at coffee shops on the pavement [...]*
20 *there's a few times when I've actually walked into a table or a board and they*
21 *fall over and you don't know [they are there]. (John, age 75)*

22 In addition, assumptions about old age also created barriers. The idea of slowing
23 down and restriction as an inevitable feature of old age was embedded within
24 participants' accounts and these were unchallenged in the discourse of some
25 participants:

26 *I mean you do less when you get to our age. (April, age 82)*

1 *Well we just have to think that we get tired more easily. (Star, age 83)*

2 This exchange between April and Star is typical of participants' reactions when
3 encountering a challenge; many justified a restriction in physical activity by reiterating
4 stereotypes about old age.

5 **Discussion**

6 The results of this study contribute to a better understanding of the meaning of
7 physical activity, current activity levels, and facilitators and barriers to physical activity
8 in older people with sight loss. The participants reported engagement in three main
9 types of physical activity: scheduled clubs or classes, opportunistic walking, and
10 activities of daily living. The reported facilitators and barriers included issues relating to
11 psychological factors, opportunity and access, and society and environment. These
12 factors must be considered in relation to two key population groups: (1) factors
13 affecting all older people and, (2) factors specific to people with sight loss.

14 The three forms of facilitators and barriers to physical activity reported by the
15 participants can be considered in relation to Crawford and Godbey's hierarchical model
16 of leisure constraints (1987; 1991; 2010). This model proposes that constraints to leisure
17 activities are found in three levels: intrapersonal (inner mental states); interpersonal
18 (influences of others on leisure choice) and structural (opportunities, environments, and
19 resources). Crawford and Godbey conceptualise these factors within a hierarchical
20 structure with intrapersonal constraints needing to be overcome before interpersonal and
21 finally structural. This broad model can help theorise constraints, but detail on specific
22 facilitators and barriers is needed in order to tailor support and intervention for
23 particular population groups such as older adults generally or older adults with sight
24 loss.

1 The World Health Organisation (WHO) recommends that adults over the age of
2 65 engage in at least 150 minutes of moderate-intensity aerobic physical activity or 75
3 minutes of vigorous-intensity aerobic physical activity or equivalent each week (World
4 Health Organization, 2010). In our sample, perceptions of the meaning of ‘physical
5 activity’ were most commonly associated with mobility and function (e.g. Cecilia
6 described climbing the stairs as physical activity while Star listed housework) rather
7 than traditional leisure activities (e.g. sport). There was little evidence to indicate any of
8 our participants were meeting WHO recommendations or held intentions to achieve this
9 target. This further supports claims regarding a prevalent lack of awareness of
10 recommended physical activity requirements (Knox, Esliger, Biddle, & Sherar, 2013).
11 However, evidence suggests that awareness alone is not enough to increase physical
12 activity and approaches that target subjective norms may be more effective (Knox,
13 Taylor, Biddle, & Sherar, 2015). Our participants appeared to perceive themselves as
14 active, through reporting activities of daily living, but would not be deemed physically
15 active when WHO guidelines are considered. One of the reasons for this related to the
16 perception that physical activity was not appropriate for older adults, illustrating
17 negative self-directed stereotypes which can be considered a specific type of social
18 norm.

19 Self-directed ageing stereotype is not unique to older people with sight loss.
20 Stereotype Embodiment Theory proposes that age stereotypes, prevalent in western
21 cultures, can be internalised by individuals across the lifespan operating unconsciously
22 on behaviour (Levy, 2009) and impacting on cognitive functioning and physical health
23 (Levy, 2003). This constraint therefore impacts on all elements of Crawford and
24 Godbey’s model (1987; 1991; 2010). On an intrapersonal level participants used
25 stereotypes as causal attributions (Weiner, 1985) to legitimise choices to refrain from

1 physical activity. Evidence suggests that attributing illness and functional decline to old
2 age and holding the belief that ‘to be old is to be ill’ is associated with negative health
3 outcomes and reduction in health maintenance behaviours (Stewart, Chipperfield, Perry,
4 & Weiner, 2012) including physical activity (Beyer, Wolff, Warner, Schüz, & Wurm,
5 2015).

6 On an interpersonal and structural level, societal stereotypes are evident through
7 policy decisions regarding the structure of built environments and the provision of
8 services. To improve physical activity levels in older people more generally, this issue
9 requires interventions to challenge societal stereotypes in line with Stereotype
10 Embodiment Theory (Levy, 2009). Consequently, if not addressed both at individual
11 and societal level, the internalisation of these stereotypes may undermine the effects of
12 individual interventions to modify health behaviours (Stewart et al., 2012) and widen
13 health inequalities. Therefore rather than a hierarchical approach as proposed by
14 Crawford and Godbey (1987; 1991; 2010), for this group it appears necessary to address
15 interpersonal influences (social norms and negative ageing stereotypes) in order to in
16 turn change intrapersonal constraints (personal relevance and self-efficacy beliefs).

17 In support of this claim, interventions that aim to foster positive age-related
18 beliefs can result in improved physical functioning over time (Levy, Pilver, Chung, &
19 Slade, 2014) and promote recovery from disability (Levy, Slade, Murphy, & Gill,
20 2012). Levy et al (2014) have illustrated that these interventions are most effective
21 when delivered implicitly in order to prevent activation of cognitive strategies that
22 preserve existing beliefs and therefore contradict positive images of ageing from being
23 internalised. This illustrates the need for public health interventions that subtly
24 challenge assumptions about old age as a time of physical restriction and reduced
25 participation. Social marketing strategies that role-model physical activity in older

1 adults and promote social norms that support WHO activity guidelines would help to
2 challenge negative ageing stereotypes and could follow the approach of other successful
3 campaigns targeting inactive population groups. For example, Sport England's national
4 'This Girl Can' campaign has increased participation in physical activity 14-40 year old
5 women by publishing and sharing stories of ordinary women participating in sport
6 (Sport England, 2016).

7 Sight loss represented an additional constraint for participants, leading to further
8 decline in physical activity and mobility. For most, sight loss had developed later in life
9 and prior to this many had engaged in leisure activities such as walking and gardening.
10 Accounts of falls, accidents and embarrassment created new intrapersonal constraints
11 including fear, frustration, reduced perception of capability and loss of autonomy as
12 family members took over daily-activities. These in-turn led to reduced participation
13 and strengthened self-directed negative ageing stereotypes. This interaction helps to
14 explain the decreases in physical activity associated with increasing sight loss severity,
15 independent of health status, reported in past research (Swanson et al., 2012) and
16 illustrates a clear need for early psychological intervention with older people diagnosed
17 with sight threatening conditions to prevent activity decline.

18 Interventions that promote perceptions of capability and self-efficacy, like
19 Claire's cane training experience, illustrate how attending to structural constraints,
20 functional barriers and intrapersonal psychological factors hold promise for successfully
21 promoting physical activity and enhancing mobility in older adults with sight loss. One
22 avenue could be to enhance the use of behavioural science within the sight loss support
23 pathway as a source of specific psychological techniques to address these intrapersonal
24 barriers. Implementation could be achieved through psychologist involvement in the
25 training of service professionals working with older adults with sight loss (e.g.

1 occupational therapists, physiotherapists, and low vision support workers) to recognise
2 and address these psychological constraints.

3 For example, motivational interviewing (MI) is a psychological counselling
4 strategy that aims to facilitate intrinsic motivation for behaviour change through
5 supporting patient-centred goal setting and resolving ambivalence (Rollnick, Miller, &
6 Butler, 2008). Evidence shows that incorporating MI techniques within physiotherapist
7 and nurse delivered exercise programmes for older adults with chronic pain can
8 significantly improve mobility and self-efficacy (Tse, Vong, & Tang, 2013). Therefore,
9 educating healthcare staff and low vision support workers in psychological techniques
10 such as MI could help to promote physical activity and mobility in older adults with
11 sight loss.

12 Interpersonal constraints reported by participants included frustration,
13 embarrassment, imposed dependence and lack of understanding from social networks
14 and these led to decreases in physical activity and reduced mobility (e.g. John's
15 reduction in gardening and Melissa's imposed assistance in the car). Research in long
16 term care institutions has indicated that dependency can result from social interaction
17 rather than from physical or functional decline (Baltes, Neumann, & Zank, 1994; Baltes
18 & Wahl, 1996). In this study participant accounts indicated that, for community
19 dwelling older adults with sight loss, this dependency through social interaction can
20 occur within familial relationships. Baltes and Wahl (1992) propose two systematic
21 patterns of interaction between older people and social counterparts: the dependence
22 support script (where dependent behaviours are attended to and treated as expected) and
23 the independence ignore script (where independent activities are ignored or
24 discouraged). These scripts can work to foster decline by acting as barriers to the
25 practice of existing skills, in turn reducing perceptions of self-efficacy. It may be that

1 the co-existence of older age and visual decline exacerbates the use of these scripts
2 within social encounters. This possibility highlights the need to include social network
3 interventions for older adults with sight loss in order to challenge these scripts and
4 promote autonomy rather than dependence.

5 The participants' accounts also supported the recommendations made by
6 Phoenix et al. (2015), which represent intervention at the structural level within the
7 hierarchical model of leisure constraints (Crawford & Godbey, 1987; Crawford et al.,
8 1991; Godbey et al., 2010), including: improved social spaces and transport options,
9 greater compliance with anti-discrimination laws, and the development and marketing
10 of opportunities for physical activity within local communities. Many of these changes
11 would benefit both older people more generally and those with sight loss. Specific
12 structural barriers for people with sight loss were highlighted by our participants
13 particularly in relation to transport when driving is no longer possible (e.g. reading bus
14 numbers). Campaigns like Guide Dogs 'Talking Buses', which is lobbying the five
15 main bus companies in the UK to install audio-visual next stop and final destination
16 announcements in order to enable blind and partially-sighted people to use buses with
17 confidence, is one way to enhance public awareness of these issues and improve
18 opportunities for this group.

19 ***Limitations***

20 Most of the participants (9 out of 13) reported macular conditions specifically
21 and while this may be a result of recruitment from two macular specific groups the
22 sample is not unusual when compared to the broader populations of older adults with
23 sight loss. For example, it was estimated that macular degeneration caused 50.5% of
24 cases of blindness in 2008 (Access Economics, 2009). Given that macular degeneration

1 is steadily increasing in prevalence, the spread of sight loss conditions in this sample
2 seemed representative of the broader UK population.

3 The sample for this study was recruited from support and activity groups for
4 individuals with sight loss and therefore may represent a limitation as those already
5 engaged in these groups may already be more physically active than non-engaged older
6 people. Additional barriers may exist for those who are currently less active, however
7 the themes presented illustrate facilitators in addition to barriers. It is likely that
8 enhancing these facilitators and addressing barriers in less active individuals would lead
9 to increased physical activity in this group. In addition, our findings link well with past
10 research conducted in different samples (e.g. Phoenix et al., 2015) suggesting that they
11 are a good starting point for the development of interventions for this population.

12 **Conclusions**

13 Older people with sight loss experience a number of barriers and facilitators to their
14 mobility and participation in physical activity. Campaigns are needed to challenge
15 unhelpful stereotypes at both psychological and societal levels, and interventions
16 grounded in evidence and theory which incorporate engagement with social networks
17 should be trialled and evaluated for increasing physical activity participation both at the
18 individual and public health level. A spectrum of interventions targeted to address
19 facilitators and barriers at psychological, opportunity and access, and society levels are
20 needed in order to achieve sustainable improvements in physical activity and mobility.

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Table 1. Participant characteristics

ID	Age	Gender	Diagnosis (self-report)	Eyes affected	NEI-VFQ Rating	Focus Group
April	82	F	Macular Degeneration	One	Good	1
Star	83	M	Macular Dystrophy	Both	Fair	1
Reg	94	M	Unknown	Both	Poor	1
Alex	77	M	Macular Degeneration and cornea failure	Both	Fair	1
Torino	94	M	Macular Degeneration	Both	Poor	2
Bet	80	F	Dry Macular Degeneration	One	Poor	2
Joe	73	M	Wet Macular Degeneration	Both	Poor	2
Eduardo	86	M	Macular Degeneration & Glaucoma	Both	Very Poor	2
Melissa	88	F	Macular Degeneration	Both	Poor	3
Cecilia	81	F	Dry Macular Degeneration	Both	Very Poor	3
William	89	M	No Eyes	N/A	Completely Blind	3
Claire	79	F	Macular Degeneration	Both	Very Poor	3
John	75	M	Glaucoma, Cataract	One (other eye is false)	Very Poor	3

Table 2. Focus group schedule

Main question	Rationale for question	Prompt (only used to encourage further discussion when necessary)
Can you describe a typical week – the sorts of physical activity do you do day to day.	To gauge the participant's levels of physical activity	Are you a member of any clubs? Do you exercise with your friends? How often do you get out of the house? What do you do when you are out? What about housework?
What things make it difficult for you to be physically active?	To determine the barriers to physical activity experienced by the participant	In what ways does vision loss affect your ability to be physically active? In what ways does vision loss make physical activity more difficult? What about when it's dark?
Are there things which make physical activity easier for you?	To ascertain what facilitators to physical activity are experienced by the participants	Do family help you be more active? Do you use any physical aids? Have you been involved with any clubs/societies/classes? What facilities are there to help you be physically active? Planning activities in advance?
What types of physical activity would you like to be more involved in?	To determine the types of activity which appeal to the participants	Group classes? Individual activities? With friends? DVD/Audio activities?

Figure 1. Theme diagram illustrating the relationship between facilitators and barriers



