

Perceived Barriers, Facilitators and Patterns of Physical Activity of Older-old Adults Living in Assisted Retirement Accommodation : a qualitative and quantitative pilot research

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Abstract

Objective: To measure physical activity and identify perceived barriers and facilitators of physical activity for people aged >80 years in assisted living (AL).

Methods: Focus groups and physical activity measures were conducted n=20 (AL) and n=20 independently living (IL). Physical activity (step counts, light and moderate to vigorous activity) was measured by SenseWear Armbands.

Results: Thematic analysis identified barrier and facilitator themes. IL participants had significantly greater step counts and spent significantly more time in light intensity physical activity than AL participants.

Conclusions: Health concerns, fear of injury and motivation were important barriers. Barriers unique to AL were perceived difficulty of physical activity and old age. Social and physical environments were key facilitators of physical activity. Social support was important for both genders. More staff involvement was a key facilitator of physical activity in AL participants. Suggestions for improving physical activity for older people living in assisted care are identified.

Keywords: Aged 80 and over; Assisted living; Barriers; Focus groups; Physical activity

Introduction

Physical activity has many health benefits which can potentially enhance successful ageing [1]. Physical activity guidelines recommend that older adults engage in moderate intensity exercise for thirty minutes, for most days of the week [2]. Despite the evidence of the benefits of an active lifestyle, approximately 77% of adults >75 years in Australia are insufficiently active [3]. Older adults are becoming a larger proportion of the population; it is estimated that the number of people aged >65 years in 2061 will comprise 22% of the population, compared with 14% in 2012. Notably adults >85 years are the fastest growing age group [4]. As the Australian population ages, it is expected that a greater number of older adults will move into aged-care facilities. From 2001-02 and 2011-12, admissions to aged-care facilities have increased by 25% [5].

The aged population can be divided into two groups, “younger older” and “older old”. Younger old are aged 60-79 years and the older old are aged over eighty years. Little is known, however, about physical activity patterns of older-old adults. First, older old adults tend to live in assisted accommodation, which are usually excluded from the sampling frame of health or physical activity surveys. Second, the social and built environment, which are important determinants of physical activity patterns in old age, have also been studied in the wider community but not in assisted accommodation [6]. Third, qualitative studies on barriers for participation rarely include the older-old population [7].

Older adults have additional age-related factors compared to younger adults, which impact on their ability to participate in physical activity. These factors include health status, potential for injury, fear of falling, and loss of social support [7-12].

This study is therefore aimed to improve our knowledge on factors that hinders or facilitate physical activity in older-old population who do not live in the community.

Specifically, we aimed to i) identify perceived determinants of

physical activity behaviour in older-old adults who live in two place of residence: assisted and independent accommodation (comparison group) using qualitative methods; ii) assess the role of the social and built environments in shaping physical activity patterns, objectively measured, by comparing activity levels of older-old adults living in these two mode of accommodations.

Methods

Participants were recruited from a retirement village in metropolitan southern Sydney (total population of 270 residents). Individuals were from independent and assisted living. The study was approved by the Human Research Ethics Committee of The University of Sydney (HERC No: 14416). Written and informed consent was obtained from participants.

Residents were invited to participate through an advertisement in their mailbox. A notice was also posted on a closed circuit TV channel. Interested participants were invited to contact the researchers. Participants were required to be: English speaking; able to walk independently with or without a walking aid; able to provide consent; and aged >65 years. Participants were excluded if they had dementia that prevented them from following instructions or giving informed consent.

The study consisted of two phases. In Phase 1 physical measures and

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face to face interviews were conducted. The interviews recorded length of time at current residence, significant co-morbidities, participants perceived as limiting walking and participation in physical activity.

Isometric quadriceps strength for each leg was measured by a cable tensiometer and balance was assessed with the Near Tandem Stand test [13].

To assess objective physical activity, participants wore a SenseWear armband for 7 days during waking hours. The SenseWear armband (Body Media Inc. Pittsburgh, PA) is a portable multisensory device that measures energy expenditure [14]. The armband was attached above the elbow on the posterior of the upper arm. Participants recorded in a diary if they did not wear the monitor during these 7 days. Data were downloaded onto Sense Wear media files containing summaries of: hours of armband data; active energy expenditure; steps per day;; sedentary behaviour; and light, moderate and vigorous physical activity (MVPA) duration; and average metabolic equivalent of tasks (hereafter, METs, which is a physiological measure expressing the energy cost of physical activities relative to complete rest, which is assigned 1MET for simplicity. Data were included if there were at least eight hours of data on three days.

In Phase 2, one month after Phase 1, four focus groups were held (2 with assisted living and 2 with independently living participants). Participants self-selected a group according to a convenient time. A convenience sample of forty participants was successfully recruited and had baseline data collected. Thirty of these individuals participated in the focus groups, with numbers in focus groups ranging from 6-12.

The duration of each focus group was between one to two hours. Specific themes identified from relevant previously published literature acted as guides for key topics discussed. Key topics leading discussions were: barriers and facilitators to physical activity; current physical activity; and specific activities that participants considered would increase participation in physical activity [7-12,15]. The focus group discussions were conducted by a physical activity researcher, audio recorded and transcribed verbatim. To maintain participants' confidentiality, transcripts were de-identified

Analysis

Differences in participants' demographic, health and physical activity profile by type of residency were examined using the chi-square test for categorical variable and t-test or Wilcoxon tests for continuous variables with parametric and non-parametric distributions, respectively. Given the small sample for quantitative analysis we reported also on "probable significant" differences with a cut off at p-value of ≤ 0.100 . Due to large differences in mean age and physical functioning between the residential types, differences in physical activity and inactivity indicators between resident types were adjusted for age and physical limitations using general linear model. We used SAS software (version 9.2) for our quantitative analysis.

A thematic analysis approach [16,17] was used to organise and explain the perceived barriers and facilitators to participating in physical activity of older people living in different levels of care in the retirement village. Initially coding was done by a single researcher and subsequently coded by an independent coder to ensure consistency [18]. Themes were identified as patterns in the data. Importance of themes was determined by repetition of a theme by different participants during the focus group discussions. Tables were developed to collate major themes and subthemes using quotes from focus groups. The tables illustrated meaning and frequency of themes.

Results

Table 1 describes the characteristics, health profile and physical status of the participants. Participants residing in assisted living were significantly older (89.2 ± 6.8 years) than those living in the independent living (78.9 ± 5 years). Gender, Body mass index (BMI) and number of chronic diseases were not significantly different between the groups. Participants in independent living had lived significantly longer at their place of residency (8.3 ± 5.7 years) compared with the participants in assisted living (1.7 ± 1.4 years).

Objectively measured physical activity participation

Physical activity data from Sense Wear armbands were collected from 14 (70%) of assisted living residents and 18(90%) of independent living residents (differences in coverage of objective assessment was not significant). Participants in independent living had significantly greater average steps per day, 5802 (SD ± 2733), compared with participants in assisted living, 1620(SD ± 1854) steps per day, $p < 0.001$. Differences in time spent in MVPA, defined as ≥ 3 METs, was approaching significance between groups, with the assisted living group achieving an average of 43(SD ± 42) minutes per day and the independent living group achieving an average of 74 minutes (SD ± 70) per day ($p = 0.093$). The independent living group on average spent significantly more time in light intensity physical activity defined as 1.6-3.0 METs (129(SD ± 62) minutes per day) than the assisted living group, (76 (SD ± 64) minutes per day). Average hours of sitting did not differ significantly between the groups.

Table 2 presents age- adjusted means of limitations to physical

Variables		Assisted N=20	Independent N=20	P-value
Gender Males: Females		6:14	7 : 13	ns
Age (years)	mean \pm SD	89.2 ± 6.8	78.9 ± 5	<0.001
Body mass index (kg/m ²)	mean \pm SD	26.6 ± 5.6	25.1 ± 4.4	ns
Overweight & obese	n (%)	11 (55)	9 (45)	ns
No. of chronic diseases ^a	mean \pm SD	2.9 (1.5))	2.6 (1.9)	ns
Self-report limitation in walking,	n (%)	2 (10)	2 (10)	ns
Self-report limitation in physical activity	n (%)	1 (5)	3 (15)	ns
Participated in focus groups	n (%)	13 (65)	17 (85)	0.038
Physical activity objectively measured	n (%)	14 (70)	18 (90)	ns
Average steps per day	mean \pm SD	1620 ± 1854	5802 ± 2733	<0.001
Average MVPA ^b minutes/day	mean \pm SD	43 ± 42	74 ± 70	0.093 ^d
Average LIPA ^c minutes/day	mean \pm SD	76 ± 64	129 ± 62	0.025
Average sitting hours per day	mean \pm SD	10.5 ± 1.3	10.0 ± 2.1	ns
Functional status				
Right leg strength (Volts)	mean \pm SD	0.69 (2.8)	1.01 (0.40)	0.01 ^d
Near tandem stand eyes open	mean \pm SD	15.8 (6.8)	24.8 (6.3)	<0.001 ^d
Near tandem stand eyes close	mean \pm SD	9.1 (7.3)	17.5 (8.6)	0.003 ^d

^a Any chronic conditions included: cancer, heart disease, stroke, high blood pressure, diabetes, COPD, asthma, Osteoarthritis, Osteoporosis, Parkinson's disease, depression, anxiety
^b MVPA= Moderate to vigorous- intensity physical activity that is ($>=3$ METs)
^c LIPA = light-intensity physical activity (1.6-3METs) ^d Non-parametric test Wilcoxon probable significant

Table 1: Participant characteristic, health profile and physical activity status by residency type.

activity, objectively measured physical activity and measures of functional status. Steps per day remained higher for the independent living group, adjusted mean of 4796 steps per day compared with 2941 steps per day for the assisted living group (p=0.08). Although there were no differences between assisted and independent living participants in the proportion reporting limitations to physical activity or walking, functional indicators of balance (i.e., leg strength and near-tandem eyes opened), were significantly lower for assisted living compared to independently living participants (Right leg strength: Assisted living (0.61V); independent living (0.95V). Near tandem stand: Assisted living (13.7 seconds); independent living 22.8 seconds) p<0.05.

Qualitative physical activity data

Several themes emerged from focus groups: barriers, facilitators, and suggestions that would increase participation in physical activity. These themes are now discussed and excerpts are presented in Tables 3 and 4 with gender and study participant identification number. Excerpt numbers are provided in brackets in the text to link with the excerpts provided in the Tables.

Barriers

Although both groups had barriers in common, the importance of barriers differed between the groups. Barriers common to both groups were health (1.0a and b), fear of injury (1.1a and b), motivation (1.2a and b), and lack of companion (1.3a and b). The barrier of lack of time (1.4) differed between groups, as it emerged only in the independent living group discussions. Barriers that were limited to the assisted living group were perceived difficulty of physical activity (1.5) and old age (1.6).

Facilitators

Three major themes emerged as facilitators of physical activity: the physical environment; the social environment; and personal factors.

Sub-themes relating to the physical environment were: scenery (1.7a and b); convenience of facilities (1.8); accessibility of paths (1.9); and strategic placement of seats (1.10). Scenery was important to both groups. A sub-theme connected to convenience of facilities that emerged as important to participants in independent living was walking distance to amenities (1.8). Physical environment sub-themes that emerged as important to the assisted living group were accessibility of paths (1.9) and the strategic placement of seats (1.10).

Sub-themes connected with the social environment were: the importance of the social aspects of physical activity; the friendliness of people (1.11a and b); social support including a companion or

	Assisted	Independent	P-value
Steps per day	2841 (865; 4927)	4796 (3221; 6453)	0.089
MVPA ^a mins/d	100 (49; 150)	103 (63; 143)	0.901
LIPA ^c mins/d	117 (61; 175)	132 (87; 177)	0.650
Sitting hrs/d	9.1 (7.5; 10.6)	9.2 (7.9; 10.4)	0.910
Right Leg Strength	0.61 (0.33; 0.89)	0.95 (0.72; 1.17)	0.039
Near tandem eyes open	13.7 (8.6; 18.8)	22.8 (18.7; 27.0)	0.003
Near tandem eyes closed	9.6 (4.5; 14.7)	11.6 (7.4; 15.8)	0.495

^a=adjusted for age and limitations in physical activity ^b=Moderate to vigorous physical activity
^c=Light- intensity physical activity

Table 2: Adjusted ^a means of physical activity, sitting and functional parameters according to type of accommodation derived from General Linear Regression model.

	Independent living	Excerpt Number	Assisted living	Excerpt Number
Sub themes				
Health	"I have Osteoarthritis and I find that restricts me sometimes and also because of my knee replacement I have trouble getting down to my feet and things like that. I think it's when you are stiff and you can't do things." Female 002	1.0a	"It's just [my] diabetes so bad at the moment ...so it's not very healthy it doesn't induce me to do any exercises". Female 016	1.0b
Fear of injury	"I used to walk every morning here until I had that fall 13 years ago and I have never walked early in the morning again because it frightened me and I really had a bad fall. " Female, 009	1.1a	"Well I used to play bowls for, 40 years but I can't play indoor bowls here now because I can't balance, I'd fall over. " Female 036	1.1b
Motivation	"For me a lot of it is just lazy, I'm a bit lazy and I think I should go for a walk, I really should go for a walk, I couldn't be bothered." Male 021	1.2a	"It's really whether I am in the mood or not. There are quite a few a nice activities that normally I might be prepared to go to but ah you can ask anybody. Given half the chance, I will go and lie down." Male 034	1.2b
Lack of companion	"I think it would be a good idea if you could have a companion, not to go by yourself because often I will walk into the shops, you see people in twos, and that way you sort of can't renege, you've got to go and I suppose it a bit more pleasant too". Female 001	1.3a	"It's nice too if you get a mate." Female 045	1.3b
Lack of time	"I find that I seem to be so busy that sometimes I just don't have time I don't know why that is but I'm involved in more things or whether things take longer to do I don't know but I find sometimes I don't have the time" Female 008	1.4a		1.4b
Perceived difficulty			"It's just getting an effort." Female 028	1.5
Old age			"I think when you are younger you are involved in sport, some type of physical activity and because when you are younger you are free of a lot of things you get as you get older, disablements and that sort of thing, complaints." Male 033	1.6

Table 3: Sub themes and example excerpts relating to barriers of physical activity participation in independent living and assisted living participants.

Sub themes	Independent living	Excerpt Number	Assisted living	Excerpt Number
Physical environment				
scenery	"The trees they make the place just lovely, beautiful. " Female 002	1.7a	"And again the gardens are beautifully kept." Male 034	1.7b
Convenience of walking distance	"The station would take me roughly 10 minutes at the most but if I want to go for a walk I will walk down there." Female 014	1.8		
Accessibility of paths			"We do a fair bit of walking around here; we haven't had any trouble [with the paths]." Female 026	1.9
placement of seats			"There is always seat around and when you do that somebody will come along and sit down and have a talk to you. " Female 045	1.10
Social environment				
Friendliness of people	"I find people that you meet on a walk are very friendly." Male 004	1.11a	"Everybody is so friendly and nice. You need never be lonely. You can just walk outside and somebody always stops and talks to you". Female 052	1.11b
Social support	"Particularly if you are a widow or widower you're surrounded by people that understand your situation that means a lot you can relate to people". Male 013	1.12a	"I notice lot of people are interested in shuffle board,... but they sit around and watch each other and barrack each other along". Male 034	1.12b
Personal factors				
Motivation	"Do what we needed to do, but you know, get people enthused about doing things. We have to do things to keep people active." Female 002	1.13		
Commitment	"You have to have people make a commitment to attend." Female 002	1.14		
Discipline	"Yeh well I've made up my mind I was going to go the gym for an hour every morning." Male 021	1.15		

Table 4: Sub themes and example excerpts relating to facilitators to physical activity participation in independent living and assisted living participants.

encouragement of others (1.12a and b). The social aspect of physical activity (1.11a and b and 1.12) was viewed as important by both groups.

Sub themes relating to personal factors in participants in independent living emerged as motivation (1.13), commitment (1.14) and discipline (1.15).

Suggestions for increasing physical activity

Organised walking groups and dancing were specific activities identified by independently living participants as most likely to increase participation in physical activity. Assisted living participants identified assistance of staff and encouragement of other participants as an important facilitator of physical activity.

Discussion

This study is the third only publication that has examined barriers and facilitators to physical activity participation among older-old adults who do not reside in the community [19,20]. This study is the first to use mixed methods with this population. There were minimal differences in objectively measured physical activity patterns between assisted and independent living groups when adjusting for age differences, with the exception of ambulatory activity (i.e., average steps per day). Assisted and independently living participants identified similar main themes as

barriers and facilitators to participation in physical activity, however, the relative importance of subthemes differed. Health concerns, fear of injury and motivation were overarching themes of barriers to participation. Health status was the main barrier for physical activity. The assisted living participants viewed health as a bigger issue than independent living participants, which may be explained by the lower functional status of the assisted living group. Alternatively, it is possible that the greater emphasis on health was due to participants in assisted living having moved into care due to ill health, which made the health issue more prominent in their recent experience. Environmental factors, whether physical or social emerged as the main themes for facilitating participation in both groups.

Consistent with findings from a recent systematic review, the independent living group perceived risk of injury and fear of falling as major barriers for physical activity [7]. This may be because the independent living residents could possibly engage in physical activity that is potentially more risky or in a wider environmental context, such as walking to shops, the train station or walking in crowds. In contrast, assisted living participants did not perceive falling as much a risk possibly due to the supervision or assistance of staff, or due to limiting their physical activity to safer environments confined to the boundaries of the retirement village.

The most prominent interpersonal facilitators were related to the social and physical environment. The support from a companion in physical activity was seen as an important facilitator in independent living whereas assisted living participants viewed assistance from staff as important in facilitating physical activity. The importance of social support to be physically active has been noted by other studies from the USA, but mostly for women [21]. In this study social support was also mentioned by men from both independent and assisted living, suggesting that as people age the gender differences may be reduced (Table 4) Except Number (1.12a and b).

The role of the physical environment in influencing physical activity levels has been extensively researched in the past decade. Findings from population surveys with older adults using objective measures of environment have been inconsistent regarding the association between environment, walkability and contribution to physical activity levels [22]. Yet, qualitative studies with older adults consistently indicate that environmental conditions are important facilitators of older adults' physical activity [11]. In this study, despite living in the same geographical area, there are differences in importance of aspects of the environment. For independently living participants, walking distance to amenities was the most important subtheme, whereas the assisted living group identified accessibility of paths and the strategic placement of seats as more important. This may reflect a lower level of cardiovascular fitness of those older-old adults in the assisted living group. Scenery emerged as a facilitator of physical activity that was important to both groups. Consistent with findings of previous studies, aesthetically pleasing neighbourhood surroundings and green spaces for walking were facilitators to physical activity emerging in all focus groups [23-26]. Although objective measures were not used to assess the quality of the environment in this specific retirement village, important observations of the first author in regards to the retirement village include: the retirement village is set in pleasant bushland; there are a small number of benches placed throughout the grounds; some paths were disrupted by tree roots and covered in tree twigs and residents were required to walk on some roads used by cars.

Walking was the most common activity that both groups participated in on a regular basis. Whether participants are less active than would be expected for their age and place of residence is difficult to assess as few studies have measured activity levels in assisted living settings [27]. The median steps for assisted living here was 898 steps per day, which is very low when compared to previous studies. Step defined physical activity levels ranged from 2000-9000 in healthy older adults aged over 65 years and 1,200-8800 for older adults with chronic conditions and disability in the community [28]. The population in this present study differs from the previous study in that participants are older and live in assisted care. In an Australian study, 12% of community-dwelling older adults aged 80 years achieved 8000 steps/day or above [29]. In this respect, the current sample presents a very low level of ambulatory activity even for their age compared to the community.

Strengths and limitations of study

Strengths of this study are the mixed methods approach combining objective physical activity measures with focus group data. Saturation was successfully met with the planned number of focus groups, as during analysis no new major themes or sub-themes arose when the final focus group transcripts were analysed. This indicates that a broad scope of perceptions of older old adults on physical activity was successfully collected. There are several limitations of this study related to methodology. A small, convenient sample was recruited from a single

retirement village in one geographical location. As participants were from one retirement village, they may have similar education levels, attitudes and beliefs. Participants that volunteered are more likely to be interested in remaining active and are more likely to have higher levels of physical activity. This selection bias has been demonstrated in previous studies of physical activity [30]. Thus due to the small sample size and convenience sample recruited representing one geographical location, the transferability of results are limited.

Conclusion

In this study the relative importance of barriers and facilitators to physical activity were different between the assisted and independent living groups. Encouraging activities which promote social interaction would appear to be the most successful strategy to increasing participation. The assisted living group may also benefit from more staff or volunteer involvement of assisting or supervising physical activities.

Finally consideration of the physical environment is recommended. If needed, creating more defined walking paths, and adding resting benches will expose communities to the necessary conditions to remain active through transition from independent living to assisted accommodation.

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