Victorian
Active Ageing
Partnership

Engaging older people in organised physical activity: Literature synthesis

move™
muscle, bone & joint health

Fitness Australia

VICTORIA
State Government

MONASH University

Suggested citation

Smith BJ, de Lacy-Vawdon C, Schwarzman J, Klein R, 2016, *Engaging older people in organised physical activity: Literature synthesis*. *MOVE muscle, bone & joint health*, Melbourne.

Acknowledgements

This literature synthesis and report was prepared for *MOVE muscle, bone & joint health* by Assoc Prof Ben Smith, Ms Cassandra de Lacy-Vawdon, Ms Joanna Schwarzman and Ms Ruth Klein of the School of Public Health and Preventive Medicine at Monash University. This work was undertaken as a key initiative within the Victorian Active Ageing Partnership, of which *MOVE* is the lead partner in collaboration with Monash University and Fitness Australia.

MOVE and the authors gratefully acknowledge the support of the Victorian Government in its funding of the Victorian Active Ageing Partnership. Thanks are also extended to the staff of Victorian organisations that took part in the consultation.

MOVE muscle, bone & joint health
263-265 Kooyong Road, Elsternwick Vic 3185
www.move.org.au

Foreword

Physical activity on a daily basis is important for the health and wellbeing of older people. Engaging in regular physical activity is known to provide numerous health benefits, including reducing the risk of chronic disease and disability, improving mental health, promoting social contact, and prolonging independent living.

There are many factors influencing whether older people engage in physical activity, including the availability and accessibility of opportunities, the appropriateness of activities and the allocation of community and organisational resources. Personal and social factors can also play a role.

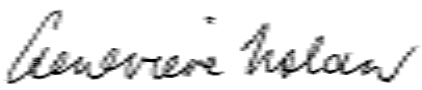
We know that opportunities for physical activity exist, but older people may not attend; we know that organisations may be trying to make older people feel welcome, but may need some help to be more effective; we know that, in some areas, there may be a duplication of effort when a 'working together' approach may bring greater results.

There are many opportunities currently available across the state of Victoria for older people to be more active. Like all things, however, there is always 'room for improvement' and an opportunity to do things better.

The Victorian Active Ageing Partnership funded by the Victorian Government aims to increase opportunities for participation in physical activity for older Victorians, especially in areas of socio-economic disadvantage and among isolated, lonely older people currently not involved in physical activity.

This evidence synthesis provides an excellent foundation to the work of the Victorian Active Ageing Partnership by examining the individual barriers and enablers to older people engaging in physical activity. Most importantly and uniquely, it also examines the organisational, program and workforce factors that can act as barriers and enablers affecting older people's participation in community-based physical activity programs.

In translating the evidence into practice, this synthesis has been used to develop an evidence-based best practice framework to guide community-based organisations in their engagement of older people in physical activity programs. It will also provide a foundation for a self-assessment tool for organisations, enabling them to review and develop their operations and practice, in order to improve physical activity opportunities for older people in Victoria.



Genevieve Nolan
Manager
Victorian Active Ageing Partnership

Table of contents

Introduction

The Australian Bureau of Statistics' (ABS) medium-level growth assumptions predict that Australians aged 65 years and over will account for 19.4% of the population by 2031 (1). The Australian Institute of Health and Welfare has highlighted the necessity for policy and strategies to promote healthy ageing, not only to ameliorate health care costs, but to maintain the social, economic and cultural participation of older people (2).

The Victorian Government's agenda for seniors is focused on addressing the broad spectrum of their needs and on policies and programs that recognise and reflect the diversity of older people's lives. This includes enabling older people to remain active within their communities, and providing access to good quality, appropriate services when they are needed, including services that enable older people to live independently in their own homes.

A promising avenue for action is promoting involvement by older people in group-based physical activities, which are provided in a variety of forms by community, recreation and health agencies. Community- and group-based physical activity (PA) programs have been found to promote social engagement, connectedness and social capital (3), as well as improved motivation, cognitive function, and quality of life (4, 5). Further, group PA programs designed for older adults have been associated with improvements in strength, posture, and flexibility (6, 7), which can assist with falls reduction and injury prevention, and better cognitive and motor functioning (5).

The Victorian Active Ageing Partnership (VAAP) supports the government's priority of promoting physical and mental health and wellbeing among older people, recognising the multiple benefits that may be gained from organised PA. VAAP aims to increase opportunities for group-based PA for older Victorians, especially in areas of socio-economic disadvantage and among isolated, lonely older people currently not involved in physical activity.

An early step in work of VAAP has been to review and synthesise literature to identify factors that need to be addressed to successfully engage older people in Victoria in organised PA. The findings of this research are presented here, examining individual barriers and enablers, program related factors, and organisational capacities that affect participation in organised PA by older people. This evidence provides a foundation for the development of a best practice framework for the delivery of older persons' PA programs, that has been prepared in a separate document available at: http://www.move.org.au/VAAP.

Methods

Literature searching

The peer-reviewed and grey literature were searched for articles and reports published between 1995 and 2015 that examined the barriers and enablers, attributes of programs, and elements of workforce and organisational capacity that influence participation by older people in organised physical activity programs. The barriers and enablers to physical activity experienced by older people were examined to provide background and context and, for this reason, a selection of review articles and studies on this topic were retrieved.

The literature concerning aspects of programs, leader characteristics and organisational capacities associated with attendance and adherence to group-based physical activity by older people was searched systematically. The databases used were Medline, PubMed, CINAHL plus, PsycINFO and the Cochrane Library. A Boolean search strategy was used, with key subject areas including 'older adults', 'physical activity', 'program', 'process evaluation', 'uptake', and 'capacity building'. Keywords used to search for older adults included 'seniors', 'elders', and '60 years'. Terms for PA included 'exercise', 'sport', 'fit*', 'endurance' and 'recreation*'. Searches for programs included 'project', 'strategy', 'activit*', 'group' and 'class'. Process evaluation was searched for as 'monitoring', 'program evaluation' and 'formative evaluation'. Keywords for uptake included 'recruit*', 'engage*', 'adhere*', 'maintain*' and 'retention'.

There were 2044 titles identified after removal of duplicates. Screening of these resulted in exclusion of 1193 papers, and the abstracts for the remainder (N=851) were read, leading to identification of 133 papers for full-text review. The reference lists of retrieved documents were examined, and *the Journal of Aging and Physical Activity* was hand searched for additional papers. Finally, the worldwide web was searched for relevant evaluation reports and literature reviews.

Consultation with activity providers

Based on the literature synthesis the authors developed a list of program attributes, facilitator skills and organisational capacities that have been found to be associated with engagement in group-based PA by older people. In order to verify the relevance of these, a purposively selected sample of providers of physical activity programs for older people in Victoria (N=15) completed an online survey to rate the importance of the elements, and to recommend other factors that affect engagement with older people. A refined list of factors was included in a second online survey, and this same group of respondents were asked to rank the importance of those within each domain (program attributes, facilitator skills and organisational capacities). The findings of this provided the basis for the best practice framework for engaging older people in physical Activity.

Barriers and enablers to physical activity reported by older people

Personal characteristics

Ill-health is a frequently reported barrier to PA among older people (8-12) and is negatively associated with the level of participation (12-14). Findings from a meta-analysis of PA interventions indicated that these had a greater effect on healthier populations as compared to ill populations (15). In particular, conditions such as urinary incontinence, musculoskeletal conditions, cancer and general poor health have been reported as reasons not to participate (8). For persons with osteoarthritis, pain has been identified as a major inhibitor of PA participation and adherence (16, 17).

Conversely, in some studies ill-health has also been reported as a motivating factor for PA participation, including among the 'oldest old' (aged 80 years and over, (9)) and among people with conditions such as hypertension and arthritis (8). The perceived benefits of PA to improve mental health and well-being have also been found to be motivators (8). However, where health conditions are exacerbated by PA or where additional symptoms have been reported, such as tiredness, fatigue, pain, shortness of breath, muscle weakness and aches, dizziness, chest pain and the fear of falling, these have been found to inhibit participation (8, 9). Similarly, symptoms associated with PA, such as laboured breathing, muscle soreness and sweating, when perceived negatively, have been shown to contribute to the idea that PA is harmful and something to be avoided (10).

Health status is also important for participation in falls prevention programs. People with good health and physical function have been shown to be more likely to participate in falls prevention programs (18), and more likely to initiate and maintain PA (13). However, in older age, perceptions of functional limitations, discomfort, unpleasant sensations, and not knowing which exercises are appropriate are identified as barriers to falls prevention program participation (18).

Positive expectations or attitudes and perceived benefits of PA have been found to be associated with the initiation of PA, whilst the realisation of expectations has been found to be a predictor of the maintenance of this behaviour (13). The confidence and sense of achievement arising from PA have also been described as motivators (8, 9). Being informed about the benefits associated with PA has facilitated participation in falls prevention (18), and, along with advice for managing physical health symptoms, has motivated PA in persons aged 80 years and over (9). Enjoyment is reported as associated with the initiation and maintenance of PA (10, 13), however it is highly dependent on individual preferences (9).

Having previous experience with PA is reportedly associated with, and perceived to be a motivator for participation (9, 14). Past experiences have also been shown to shape attitudes towards PA (8). Previous PA habits are described as being associated with PA adherence and intentions to initiate and maintain PA (13). Meanwhile, having limited knowledge of exercises or not knowing where to start has been described as a barrier (18).

Self-perceptions concerning personality types (e.g., laziness, no will power) and of being too old, have been described as barriers (8, 9, 18). Other beliefs about the unavoidable nature of aging, or being too young to be at risk of falling, have also been cited as reasons why exercise is not a personal priority (8).

Social influences

External social influences on the individual such as encouragement or support from family, peers, or health professionals appear to have an impact on PA participation and maintenance in older adults (8). In particular, encouragement from family and peers has been reported to have a positive influence on older adults' engagement (8-10). Social support from significant others and having a sports partner is also associated with initiation of PA, whilst having a good social network is positively associated with both initiation and maintenance (13).

In the 'oldest old' (aged 80 years and over) fewer role models for exercise and less social support may be available. However, the positive influences of family and peers are still important, and socialising in a group can be a PA enabler (9).

A number of social demands and obligations have been reported as barriers to PA by older people. These have been described in terms of time pressures and competing priorities and household and community obligations, including care giving responsibilities (8, 9).

Environmental factors

Safe environments, free from crime and traffic, have been reported to have a positive influence upon neighbourhood PA among older people (9, 10, 13). The presence of facilities within the community has also been found to be an enabling factor (10). Interestingly, a lack of association has been found between other features of the environment (e.g., footpaths, lighting, etc.) and the initiation or maintenance of PA in the neighbourhood by older people (8, 13).

Long term residents in nursing homes face similar barriers to PA participation. However, these also include staffing pressures to transport residents to classes, tailor PA classes to residents' needs, and to complete residents' personal care (19). Specifically, having an activity coordinator in the nursing home has been associated with exercise attendance in the UK (20). Meanwhile, lacking space, equipment, appropriate lighting and outdoor areas for PA have also been identified as barriers in these settings (19).

Program attributes associated with participation

There were 9 qualitative studies that reported the findings of focus groups and/or in-depth interviews with program participants and deliverers of organised PA programs for older people, and 7 studies that used mixed-methods approaches. Because there was little evidence of data triangulation in the mixed-methods studies, and the most relevant findings were qualitative, these were combined with the purely qualitative studies. Twelve of the included studies used quantitative designs. In most cases these looked for program features that were statistically associated with attendance and/or ongoing participation in group PA by older people.

Findings from qualitative and mixed-methods studies
The main findings of these regarding factors that affected program attendance and adherence are presented below under the headings of: program content; behaviours of activity providers; social environment of groups; program accessibility, and; experience of program benefits.

Program content: It is widely reported that tailoring the content of programs to the abilities and preferences of older participants is important (21-23). In several studies participants have highlighted that they need to enjoy the activities conducted and that music can enhance their experience (10, 21, 24, 25). There have been diverse findings concerning the type of physical activities that are considered worthwhile and enjoyable, and it is apparent that participants value activities that: are purposeful and have functional benefit (e.g., balance, mobilitity and control)(26); have a strength training component, because of the feedback and sense of progress this offers (26), and; are varied and give a complete body workout (25, 27, 28). For groups such as those with osteoarthritis, aqua-based activities have been found to involve less stress on the body and be easier to adhere to than land-based activities (29).

Feedback from a mixed-methods study found that participants value facility-based group programs more than independent or home-based sessions (30). Additionally, in studies focusing on the 'oldest old' and falls prevention respectively, more frequent PA sessions were described as facilitating higher adherence than less frequent sessions (9, 18).

Behaviours of activity providers: Several studies reported that having supportive and encouraging instructors, who provided individual assessment and feedback, promoted program attendance (31-33). In addition, a selection of studies found that having knowledgeable staff built confidence and trust among participants (26), and feeling valued and respected by staff, are important influences upon participation (21).

A qualitative systematic review found that older adults were more comfortable in classes with professional supervision rather than peer-led sessions (8). Strong leadership and providing encouragement whilst tailoring exercises to individual capabilities have been said to have positive effect on enabling PA participation in two systematic reviews (8, 18). Meanwhile, developing rapport and interacting socially with the instructor (8) and having an instructor with a 'likeable' personality (16) can also contribute positively to older adults' PA participation.

Active follow-up of those who do not attend classes (21) and communicating to non-attenders that they are missed (23) have been found to reduce dropouts. One study reported that low staff to participant ratios promoted participation (28).

Social environment in groups: A consistent finding in a range of studies is that the social climate within groups is a critical aspect of the participation experience. The opportunities for socialisation and support in groups are valued by participants (22, 26-28, 30, 31) with it often reported that get-togethers and shared food after groups are enjoyable aspects of the experience (21, 23, 25).

Some studies have found that health care provider support is a positive influence upon participation (27, 28). Health professionals are described as having an important role in working through patient perceptions in those aged 80 years and over and in advising patients on suitable exercises in the context of their medical conditions (9, 10).

The make-up of the group is described as particularly important to exercise maintenance, with older adults preferring to exercise in groups of people from the same age group, gender and level of physical ability (13). Participants in selected studies have reported that having a shared language, religion, gender, customs and traditions improved their experience within groups (22, 27, 28). In particular, findings from studies with diverse ethnic groups have found that group make-up is particularly important for culturally and ethnically diverse older adults (34, 35).

Program accessibility: Suitability of timing and cost (low cost or free) are factors widely reported to influence participation in PA groups for older people (8, 9, 18, 21, 24, 27). Participants commonly report that access to transport is vital for attendance (21, 24, 27). Adopting a flexible group schedule has been found to be a useful method of combatting transport challenges (26). In one study, participants stated that they preferred programs that are offered close to home and appreciated those delivered at sites offering other activities (e.g. churches, senior centres) (27).

Experience of program benefits: Several studies have reported that being able to identify and experience personal benefits from group PA has a positive influence upon attendance by older people (24, 25, 28, 31, 36). Having individualised goals and achieving these has been found to be a motivator for participation (23, 28), as has meeting individual outcome expecations, and members feeling that they are contributing to the community through their program involvement (26).

Findings from quantitative studies

The studies using quantitative designs provided useful insights about the mode and location of program delivery, preferred PA types and intensities. A number of influences upon participation identified in this research, particularly experience of program benefits and supportive leaders, concur with the findings of the qualitative studies.

Group mode of delivery: A meta-analysis of 37 randomised controlled trials (RCTs) of PA programs for older people found that group-based PA programs resulted in significantly higher levels of participation than individually conducted programs (37). Similarly, people with chronic conditions such as osteoarthritis have also been reported to prefer group sessions over individual sessions (38).

Facility-based location: The abovementioned meta-analysis of 37 RCTs reported that facility-based PA achieved significantly higher rates of adherence than home-based activity (37).

Type of physical activity: A consistent finding has been that resistance exercise achieves significantly higher attendance than aerobic exercise (37). Some research has found that program drop-out varies with the type of activity being conducted; for instance it has been found to be lower for cycling and higher for programs run by sports therapists (25, 39). Activities that are seasonally appropriate (e.g., swimming in summer) have been reported to have lower levels of drop-out (39, 40).

Intensity of activity: Contrary to expectations, several studies report that programs involving higher intensity activities achieve greater adherence than those of moderate or low intensity (38, 41). In regard to program frequency and duration, one study found that adherence by older people with osteoarthritis was higher in programs less than 20 weeks long and with two or more sessions per week (38). Meanwhile, a longitudinal study of existing PA classes found that classes had greater attendance when they were offered over a greater number of weeks (42).

Other program features: Identification of personal benefits from participation that align with older people's goals and outcome expectations, has been found to be associated with attendance at PA programs (42, 43). Goal setting and feedback has been reported to assist participants to gauge whether classes are meeting expectations, to facilitate positive attitudes and greater attendance (42). The findings concerning the impacts of the social environment upon program attendance are not consistent. One quantitative study did not find that social support was significantly associated with program adherence (43), meanwhile another found that social interaction, both during and after class, was significantly associated with higher attendance whilst social bonding over the activities was not (42). One investigation of attendance at a church-based PA program reported that level of affiliation with the church community was positively associated with motivation to attend (44).

Capacities required for successful delivery of programs

The literature searching did not identify any empirical studies of workforce or organisational capacities that have an influence upon the engagement of older people in organised PA programs. There were, however, recommendations made in a number of articles and reports that were relevance to various aspects of program delivery capacity, especially workforce skills and partnerships, and to a lesser extent organisational priorities and structures, and resource allocation. A synthesis of the recommendations pertinent to each of these domains of capacity have been summarised in the table below.

Table 1: Recommended capacities for delivery of PA programs for older people

Capacity domain	Requirements for program delivery
Workforce (leaders, instructors)	Training and accreditation in safe forms of activity for older people (45-48). Ability to perform individual assessments and tailoring of programs (25, 38, 46, 49-51). Skills in monitoring participants and providing accurate and regular feedback (52). Skills in giving instruction in multiple types of activity (e.g., strength, balance, endurance) (52). Contacts with groups and organisations from which program participants can be recruited (47). Interpersonal abilities to build rapport and bond with participants and facilitate social cohesion between members (42, 48, 50). Personal interest in, and commitment to, members (38, 48, 51). Commitment to participatory processes and ability to effectively consult with members (21, 38). Cross-cultural awareness and ability to apply this in program design and leadership (50). Motivational training to motivate participants and promote higher attendance (42).
Partnerships	Collaboration with government departments and other stakeholders to develop standards, policies, and procedures related to program delivery (46). Engagement with community based organisations focusing on caregiving and helping others, to recruit volunteer leaders and sustain programs (45, 52). Collaboration with health care providers to obtain guidance about safety and appropriateness of programs (52). Develop relationships with community organisations in contact with vulnerable groups, to facilitate their involvement in programs (21).

Organisational priorities and structures	Social justice commitment to groups in need (21). Flexible work arrangements and supportive culture for staff (51). Establishment of a risk procedure and emergency plan, with accompanying training (52). Procedures to cover classes where instructors are unable to attend (42).
Resource allocation	Funds to enable programs to charge low fees, or be offered for free (49). Program venues that are comfortable, safe and physically accessible, with good access to transport (46, 49). Adequate space for storage of equipment (46, 47). Adequate and comfortable (warm) change-room facilities for participants (29).

Consultation concerning facilitators of engagement with older people

In order to apply the findings of this literature synthesis to the development of a best practice framework for engaging older people in physical activity, the range of factors found to be associated with attendance and engagement in organised PA were listed under the headings of: program design and delivery (N=16); qualities of group leaders (N=9), and; attributes of organisations providing programs (N=9). Next, a purposive sample of providers of activity programs for older people in Victoria was recruited to complete an online survey to rate the importance of each of these factors on a scale between 1 (not important) and 10 (very important). Survey respondents represented health services (N=7), leisure and recreation facilities (N=6) and local councils (N=2). The online survey also allowed respondents to recommend other factors considered to be important for the successful engagement of older people.

Table 2 shows the mean ratings out of 10 for all of the factors listed in the first round survey. There was strong verification of the factors identified in the literature synthesis, with 31 of the 34 factors (91.2%) receiving a mean importance rating of >8 out of 10. An additional six factors were recommended by respondents as relevant to the successful engagement of older people, as shown the Table. In a second round online survey, all 40 factors were listed and respondents were asked to rank those from 1-10 in order of perceived importance. The final ranking of the factors is shown below.

Table 2: Perceived importance of factors that facilitate engagement by older people in group-based PA

Factor	Mean importance	Ranking 1-10
Program design and delivery		
Creating a friendly and welcoming environment	9.8	2
Physical activities that can be modified for different abilities	9.7	5
Conducting exercises that assist with daily functioning	9.6	1
Including a strength training component	9.5	3
Providing physical assessments and feedback to participants	9.2	8
Offering groups at a variety of times during the week	8.9	10
Setting goals with each participant	8.7	6
Opportunities for social get-togethers outside of the group	8.7	
Using venues known to participants (e.g., seniors' centres, churches)	8.5	
Offering reduced fees for Health Care Card holders	8.5	4
Playing music during activities	8.4	
Offering language or culture specific groups	8.3	
Availability of language assistance for non-English speaking people	8.2	
Providing low cost transport	7.5	9
Using venues close to public transport	7.4	
Charging nil or low fees	7.3	7
Other factors recommended:		
Providing water and other refreshments for participants		

Qualities of group leaders		
Training and accreditation in safe forms of activity	9.6	1
Ability to assess participants and tailor programs to their abilities	9.6	2
Skills in monitoring participants and providing feedback	9.5	9
Skills in giving instruction in multiple types of activity	9.5	3
Interpersonal abilities to build rapport and social cohesion	9.4	6
Personal interest in, and support of each group member	9.4	8
Commitment to participatory processes and ability to consult with group	9.3	
Cross-cultural awareness and ability to apply this in program	9.2	10
Contacts with groups/organisations for recruitment of participants	8.7	
Other factors recommended:		
First Aid certification		5
Keeping up-to-date with new developments in exercise		4
Ability to refer group participants to health or other services		7
Attributes of organisations providing programs		
Establishment of a risk procedure and emergency plan	9.3	2
Funds to enable programs to charge low fees	9.1	5
Adequate space for storage of equipment	9.1	6
Access to health professionals for advice about safe activities	9.1	3
Social justice commitment to recruit high needs participants	9.0	7
Links with organisations to recruit high needs groups	9.0	8
Collaboration with agencies to develop policies and standards	8.9	10
Engagement with community organisations to recruit leaders	8.9	
Flexible hours and work arrangements for group leaders	8.6	9
Other factors recommended:		
Access to venues that are safe and suitable		1
Possession of equipment that group members require for exercise		4

Refinement of factors to include in best practice framework

A final review of the findings of this literature synthesis and consultation, by the VAAP Coordinating Team, resulted in the rewording and regrouping of the factors shown above so that these could be transferred into a logical and easy-to-understand best practice framework for engaging older people in physical activity. The factors were organised under the following headings: appropriate and rewarding programs; skilled and attentive leaders, and; committed and equipped organisations.

The final best practice framework can be found at: http://www.move.org.au/VAAP.

References

1. Australian Bureau of Statistics. Population Projections, Australia, 2012 (base) to 2101. Canberra: 2013.
2. Australian Institute of Health and Welfare. Australia's Health 2014. Canberra: 2014.
3. Moore M, Warburton J, O'Halloran PD, Shields N, Kingsley M. Effective community-based physical activity interventions for older adults living in rural and regional areas: A systematic review. *Journal of Aging & Physical Activity*. 2016;24(1):158-67.
4. Kamegaya T, Araki Y, Kigure H, Long-Term-Care Prevention Team of Maebashi C, Yamaguchi H. Twelve-week physical and leisure activity programme improved cognitive function in community-dwelling elderly subjects: a randomized controlled trial. *Psychogeriatrics*. 2014;14(1):47-54.
5. Maki Y, Ura C, Yamaguchi T, Murai T, Isahai M, Kaiho A, et al. Effects of intervention using a community-based walking program for prevention of mental decline: a randomized controlled trial. *Journal of the American Geriatrics Society*. 2012;60(3):505-10.
6. American College of Sports Medicine Position Stand. Exercise and physical activity for older adults. Medicine & Science in Sports & Exercise. 1998;30(6):992-1008.
7. Shumway-Cook A, Silver IF, LeMier M, York S, Cummings P, Koepsell TD. Effectiveness of a community-based multifactorial intervention on falls and fall risk factors in community-living older adults: a randomized, controlled trial. *Journals of Gerontology Series A: Biolgical Science & Medical Science*. 2007;62(12):1420-7.
8. Franco MR, Tong A, Howard K, Sherrington C, Ferreira PH, Pinto RZ, et al. Older people's perspectives on participation in physical activity: a systematic review and thematic synthesis of qualitative literature. *British Journal of Sports Medicine*. 2015;49(19):1268-76.
9. Baert V, Gorus E, Mets T, Geerts C, Bautmans I. Motivators and barriers for physical activity in the oldest old: a systematic review. *Ageing Research Reviews*. 2011;10(4):464-74.
10. Schutzer KA, Graves BS. Barriers and motivations to exercise in older adults. *Preventive Medicine*. 2004;39(5):1056-61.
11. Bird M-L, Pittaway JK, Cuisick I, Rattray M, Ahuja KDK. Age-related changes in physical fall risk factors: results from a 3 year follow-up of community dwelling older adults in Tasmania, Australia. *International Journal of Environmental Research & Public Health*. 2013;10(11):5989-97.
12. Macniven R, Pye V, Merom D, Milat A, Monger C, Bauman A, et al. Barriers and enablers to physical activity among older Australians who want to increase their physical activity levels. *Journal of Physical Activity & Health*. 2014;11(7):1420-9.
13. van Stralen MM, De Vries H, Mudde AN, Bolman C, Lechner L. Determinants of initiation and maintenance of physical activity among older adults: A literature review. *Health Psychology Review*. 2009;3(2):147-207.
14. Koeneman MA, Verheijden MW, Chinapaw MJ, Hopman-Rock M. Determinants of physical activity and exercise in healthy older adults: a systematic review. *International Journal of Behavioral Nutrition & Physical Activity*. 2011;8:142.
15. Chase JA. Interventions to increase physical activity among older adults: A meta-analysis. *The Gerontologist*. 2015;55(4):706-18.

16. Fisken A, Keogh JWL, Waters DL, Hing WA. Perceived benefits, motives, and barriers to aqua-based exercise among older adults with and without osteoarthritis. Journal of *Applied Gerontology*. 2015;34(3):377-96.
17. Marks R, Allegrante JP. Chronic osteoarthritis and adherence to exercise: A review of the literature. *Journal of Aging & Physical Activity*. 2005;13(4):434.
18. Bunn F, Dickinson A, Barnett-Page E, McInnes E, Horton K. A systematic review of older people's perceptions of facilitators and barriers to participation in falls-prevention interventions. *Ageing & Society*. 2008;28(04):449-72.
19. Benjamin K, Edwards N, Ploeg J, Legault F. Barriers to physical activity and restorative care for residents in long-term care: A review of the literature. *Journal of Aging & Physical Activity*. 2014;22(1):154-65.
20. Finnegan S, Bruce J, Lamb SE, Griffiths F. Predictors of attendance to group exercise: a cohort study of older adults in long-term care facilities. *BMC Geriatrics*. 2015;15:37.
21. Stickney B, Vilshanskaya O. Engaging older people with English as a second language and frail older people in physical activity. *Health Promotion Journal of Australia*. 2005;16(2):116-23.
22. Dunlop WL, Beauchamp MR. Birds of a feather stay active together: A case study of an all-male older adult exercise program. Journal of Aging & Physical Activity. 2013;21(2):222-32.
23. Hawley-Hague H, Horne M, Skelton DA, Todd C. Older adults' uptake and adherence to exercise classes: Instructors' perspectives. *Journal of Aging & Physical Activity*. 2016;24(1):119-28.
24. Sharon BF, Hennessy CH, Brandon LJ, Boyette LW. Older adults' experiences of a strength training program. *Journal of Nutrition, Health & Aging*. 1997;1(2):103-8.
25. McPhate L, Simek EM, Haines TP, Hill KD, Finch CF, Day L. "Are your clients having fun?" The implications of respondents' preferences for the delivery of group exercise programs for falls prevention. *Journal of Aging & Physical Activity*. 2016;24(1):129-38.
26. Stathi A, McKenna J, Fox KR. Processes associated with participation and adherence to a 12-month exercise programme for adults aged 70 and older. *Journal of Health Psychology*. 2010;15(6):838-47.
27. Chiang K-C, Seman L, Belza B, Tsai JH-C. "It is our exercise family": Experiences of ethnic older adults in a group-based exercise program. Preventing Chronic Disease. 2008;5(1):A05.
28. Martin AM, Woods CB. What sustains long-term adherence to structured physical activity after a cardiac event? *Journal of Aging & Physical Activity*. 2012;20(2):135-47.
29. Fisken A, Keogh JW, Waters DL, Hing WA. Perceived benefits, motives, and barriers to aqua-based exercise among older adults with and without osteoarthritis. *Journal of Applied Gerontology*. 2015;34(3):377-96.
30. Hedley L, Suckley N, Robinson L, Dawson P. Staying Steady: a community-based exercise initiative for falls prevention. *Physiotherapy Theory & Practice*. 2010;26(7):425-38.
31. Gavin TS, Myers AM. Characteristics, enrollment, attendance, and dropout patterns of older adults in beginner Tai-Chi and line-dancing programs. *Journal of Aging & Physical Activity*. 2003;11(1):123-41.

32. Gillis DE, Grossman MD, McLellan BY, King AC, Stewart AL. Participants' evaluations of components of a physical-activity-promotion program for seniors (CHAMPS II). *Journal of Aging & Physical Activity*. 2002;10(3):336-53.
33. Jancey JM, Clarke A, Howat PA, Lee AH, Shilton T, Fisher J. A physical activity program to mobilize older people: a practical and sustainable approach. *The Gerontologist*. 2008;48(2):251-7.
34. Belza B, Walwick J, Shiu-Thornton S, Schwartz S, Taylor M, LoGerfo J. Older adult perspectives on physical activity and exercise: Voices from multiple cultures. *Preventing Chronic Disease*. 2004;1(4):A09.
35. Horne M, Skelton DA, Speed S, Todd C. Perceived barriers to initiating and maintaining physical activity among South Asian and White British adults in their 60s living in the United Kingdom: A qualitative study. *Ethnicity & Health*. 2013;18(6):626-45.
36. Resnick B, Spellbring AM. Understanding what motivates older adults to exercise. *Journal of Gerontological Nursing*. 2000;26(3):34-42.
37. Hong S-Y, Hughes S, Prohaska T. Factors affecting exercise attendance and completion in sedentary older adults: A meta-analytic approach. *Journal of Physical Activity & Health*. 2008;5(3):385-97.
38. Marks R, Allegrante JP. Chronic osteoarthritis and adherence to exercise: A review of the literature. *Journal of Aging & Physical Activity*. 2005;13(4):434-60.
39. Stiggelbout M, Hopman-Rock M, van Mechelen W. Entry correlates and motivations of older adults participating in organized exercise programs. *Journal of Aging & Physical Activity*. 2008;16(3):342-54.
40. Ecclestone NA, Myers AM, Paterson DH. Tracking older participants of twelve physical activity classes over a three-year period. *Journal of Aging & Physical Activity*. 1998;6(1):70.
41. Visek AJ, Olson EA, DiPietro L. Factors predicting adherence to 9 months of supervised exercise in healthy older women. *Journal of Physical Activity & Health*. 2011;8(1):104-10.
42. Hawley-Hague H, Horne M, Campbell M, Demack S, Skelton DA, Todd C. Multiple levels of influence on older adults' attendance and adherence to community exercise classes. *The Gerontologist*. 2014;54(4):599-610.
43. Brassington GS, Atienza AA, Perczek RE, DiLorenzo TM, King AC. Intervention-related cognitive versus social mediators of exercise adherence in the elderly. *American Journal of Preventive Medicine*. 2002;23(2 Suppl):80-6.
44. Izquierdo-Porrera AM, Powell CC, Reiner J, Fontaine KR. Correlates of exercise adherence in an African American church community. *Cultural Diversity & Ethnic Minority Psychology*. 2002;8(4):389-94.
45. Brittain DR, Gyurcsik NC. Perceptions of trained leaders on improving the public health impact of three arthritis foundation programs. *Health Promotion Practice*. 2010;11(4):572-9.
46. Benjamin K, Edwards N, Caswell W. Factors Influencing the physical activity of older adults in long-term care: Administrators' perspectives. *Journal of Aging & Physical Activity*. 2009;17(2):181-95.
47. Day L, Trotter MJ, Donaldson A, Hill KD, Finch CF. Key Factors Influencing Implementation of Falls Prevention Exercise Programs in the Community. *Journal of Aging & Physical Activity*. 2016;24(1):45-52.

48. Estabrooks PA, Munroe KJ, Fox EH, Gyurcsik NC, Hill JL, Lyon R, et al. Leadership in physical activity groups for older adults: A qualitative analysis. *Journal of Aging & Physical Activity*. 2004;12(3):232-45.
49. Goodman C, Davies S, Tai SS, Dinan S, Iliffe S. Promoting older peoples' participation in activity, whose responsibility? A case study of the response of health, local government and voluntary organizations. *Journal of Interprofessional Care*. 2007;21(5):515-28.
50. Goodman R, Yoo S, Jack L. Applying comprehensive community-based approaches in diabetes prevention: Rationale, principles, and models. *Journal of Public Health Management & Practice*. 2006;12(6):545-55.
51. Hawley H, Skelton DA, Campbell M, Todd C. Are the attitudes of exercise instructors who work with older adults influenced by training and personal characteristics? *Journal of Aging & Physical Activity*. 2012;20(1):47-63.
52. Cress ME, Buchner DM, Prohaska T, Rimmer J, Brown M, Macera C, et al. Best practices for physical activity programs and behavior counseling in older adult populations. *Journal of Aging & Physical Activity*. 2005;13(1):61-74.