Journal of Health and Social Sciences 2020; 5,1:091-102
The Italian Journal for Interdisciplinary Health and Social Development

NARRATIVE REVIEW IN GERIATRICS AND PUBLIC HEALTH

Time to speed up, not slow down: A narrative review on the importance of community-based physical activity among older people

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Abstract

Introduction: There is now substantial evidence that physical activity reduces the risk of falls and physical disability in later life. Despite encouragement, many older adults are not accruing the health benefits of an active lifestyle. The purpose of this review is to provide an update on the literature specifically highlighting the benefits of regular physical activity (PA) for older adults in the community setting.
Methods: An exploratory, narrative review was constructed from peer-reviewed journal articles after a literature database search involving *Google Scholar*, *SPORTDiscus,* and *PubMed*. We considered all types of article and study design written in English language and published with a date range set between 2002 to 2018.
Results: A multitude of benefits related to the effects of physical activity with older adults were recognised in the literature search. Two overarching thematical dimensions were formed to represent the findings of this review: 1) functional ability and independence, and 2) psychological health and social connectedness. Our findings showed that community-based group exercise programmes have been found to positively enhance older adult's physical function, improving mobility and flexibility. The primary components related to successful ageing are: 1) The absence of disease and disability, 2) the maintenance of physical and cognitive function, and 3) continued involvement in social activities.
Discussion: While the prescription and community-based programmes for older adults vary in format, structure and effectiveness, it is perhaps more important to promote the general concept of encouraging as many individuals to participate and adhere to sustained PA in later life, particularly as so many benefits are accrued from simply taking part.

KEY WORDS: Functional independence; Non-systematic literature review; physical activity; psychological health; older adults.

Riassunto

Introduzione: Esiste una sostanziale evidenza che l'attività fisica riduce il rischio di cadute e di disabilità fisica nelle fasi avanzate della vita. Nonostante siano incoraggiati, molti anziani non stanno ottenendo benefici per la salute derivanti da uno stile di vita attivo. La finalità di questa revisione è di fornire un aggiornamento sulla letteratura evidenziando in modo specifico i benefici dati dall'attività fisica svolta in modo regolare per gli anziani in ambienti comunitari.
Metodi: Una revisione narrativa esploratoria è stata realizzata a partire da articoli scientifici sottoposti a peer review dopo una ricerca di letteratura su database quali *Google Scholar*, *SPORTDiscus,* and *PubMed.* Abbiamo considerato tutte le tipologie di articoli ed i disegni di studio scritti in inglese e pubblicati tra il 2002 ed il 2018.
Risultati: Un grande numero di benefici correlati agli effetti dell'attività fisica nell'età adulta sono stati identificati dalla ricerca. Due dimensioni tematiche generali sono state create per rappresentare i risultati di questa revisione: 1) la capacità funzionale e l'indipendenza; 2) la salute psicologica e le relazioni sociali. I nostri risultati hanno evidenziato che i programmi di attività fisica su base comunitaria hanno positivamente rinforzato la funzionalità fisica negli anziani, migliorando la loro mobilità ed agilità. Le componenti primarie correlate ad un invecchiamento soddisfacente sono risultate: 1) l'assenza di malattia e di disabilità; 2) il mantenimento della funzionalità fisica e cognitiva ed 3) il continuo coinvolgimento nelle attività sociali.
Discussione: Mentre la prescrizione ed i programmi su base comunitaria per gli anziani variano nello schema, nella struttura e nell'efficacia, è forse più importante promuovere il concetto generale di incoraggiare tanti più individui possibili a partecipare e ad aderire ad una costante attività fisica nella vita adulta, dal momento che molti benefici sono ottenuti dalla semplice partecipazione.

TAKE-HOME MESSAGE

Community-based physical activity may vary in format and structure, and the multitude of benefits mean that encouraging the older generation to be active more often and allowing more access to in the community setting is paramount for both functional independence and social connectedness of older adult generations.

Competing interests - none declared.

Cite this article as: Hambrook R, Middleton G, Bishop DC, Crust L, Broom DR. Time to speed up, not slow down. A narrative review on the importance of community-based physical activity among older people. J Health Soc Sci. 2020;5(1):091-102

DOI 10.19204/2019/tmts7

Received: 29/07/2019 Accepted: 15/12/2019 Published Online: 15/02/2020

INTRODUCTION

Through a combination of both eugeric ('unavoidable ageing related issues') and pathogeric ageing ('unhealthy or unnecessary ageing issues'), a wide range of physical, psychological, cognitive and social changes are experienced by adults as they grow old [1]. Older adults exhibit the highest prevalence of degenerative musculoskeletal conditions such as osteoporosis, arthritis, and sarcopenia [2]. The International Osteoporosis Foundation estimates that an osteoporotic fracture occurs every 3 seconds in the World [3]. Each year, one in three adults aged 65 years and over sustains a fall and this is higher in those older than 80 years [4–5]. Multiple mechanisms, in isolation or any combination of pain, muscle weakness, and/or decreased proprioception can lead to a fall [6]. Approximately 24% of those who fall require medical attention due to sustaining a serious injury such as a sprain or fracture [7]. Dealing with and supporting age-related degenerative conditions creates large demands on health services [8]. Nearly two-thirds of the people admitted to hospital each year are over 65 years old. This age group accounts for 2 million unplanned admissions per year and up to 70% of hospital emergency bed days [9]. When older adults are admitted to hospital, they often stay for long periods and are more likely to be readmitted than younger individuals [10]. The global population aged 60 years and over is set to increase from 841 million in 2013 to more than 2 billion by 2050 [11]. Therefore in a growing population of adults, healthy ageing is becoming a crucial factor to reduce the burden of disease and disability and the related healthcare costs [12].

Importantly, there is substantial evidence that physical activity (PA) improves balance, reduces the risk of falls and the risk of physical disability in later life therefore improving quality of life and allowing older adults to live independent lives [13–15]. In order for PA to be beneficial, the UK's Chief Medical Officers' current and previous recommendations for older adults are as follows: Older adults should aim to be active daily and over a week, activity should add up to at least 150 minutes of moderate intensity activity in bouts of 10 minutes or more [16, 17]. For those who are already regularly active at moderate intensity, comparable benefits can be achieved through 75 minutes of vigorous intensity activity spread across the week or a combination of moderate and vigorous activity [16, 17]. Older adults should also undertake PA to improve muscle strength on at least two days a week and those at risk of falls should incorporate PA to improve balance and co-ordination on at least two days a week [16, 17]. The American Physical Activity guidelines have also suggested multicomponent physical activity which include aerobic, muscle-strengthening activities and balance training [18]. Regardless, older adults who participate in any amount of PA will gain some health benefits, including maintenance of good physical and cognitive function [17]. Some PA is better than none, and more PA provides greater health benefits. Despite these recommendations, it is estimated that over 60% of older adults are not able to achieve the minimum amount of PA recommended [19]. The Health and Social Care Information Centre [20], data from the 2016 Health Survey for England and report that only 48% of men and 41% of women aged 65 years and above meet the PA recommendations, so many are not accruing the health benefits of an active lifestyle. The objective of this narrative review study was to explore the literature surrounding the benefits of regular PA for older adults who reside in the community. The community is regarded as an important 'setting' for health promotion and is often targeted by those delivering health improvement programmes/ interventions. Furthermore, despite the increasing fragility of the ageing older adult, the positive role physical activity may have in this setting should be explored with this community context.

METHODS

Study design

The authors followed guidance on producing a non-systematic or narrative review [21,

22]. Ferrari's [22] suggested framework was adhered to in the initial introduction where we outlined the objective and scope of this exploratory review, this following section now highlights the procedures involved in our database searches including progressing the searchable terms through two phases. The results section clearly establishes thematic representation of the topic which essentially reveals strong patterns 'reoccurring' in the reading conducted by the research team. We reached consensus on the labelling and sectioning of this part of the review.

Study procedures

Research studies were drawn from a literature search which only targeted peer-reviewed journal articles. The following databases were explored: *Google Scholar*, *SPORTDiscus* and *PubMed/Medline* with a date range set between 2002 to 2018 (16 years). These databases represent a varied range of disciplines allied to medicine and health including exercise science. Initially, the search utilised the following keywords: 'older people', 'older adults', 'geriatric', 'elderly', 'exercise', 'physical activity' 'community' and 'community-based' resulting in 20,897 searchable items. After this initial phase, the following additional terms were combined with previous keywords: 'intervention', 'programme', 'community-dwelling', 'care homes', 'seniors', 'movement', 'balance', 'coordination', 'cognition', 'fitness', 'mobility', 'psychology', 'social support' and 'citizen centres'. To narrow down the articles for selection in the review, abstracts resulting from the search were screened. Only English language papers were included with authors' having full access via their institution and found duplicates were removed. The reference lists of relevant papers were hand-searched for further publications. In contrast to a systematic review, there were no specified study criteria for inclusion or inclusion apart from the age range using in searching for articles, therefore we considered all types of article and study design. The final review was based on the thirty-nine selected articles and the following sections are structured to illustrate two key thematic dimensions: 1) *functional ability and independence*, and 2) *psychological health and social connectedness.*

RESULTS AND DISCUSSION

Functional ability and independence

Longevity can be an objective for older adults, but the maintenance of functional independence should be a higher priority to maintain quality of life (QOL) in the process of healthy ageing [23, 24]. In older adults, multicomponent training, including muscle strength and aerobic fitness elements have been found to improve functional independence [23, 24], enhancing the ability to cope with the demands of undertaking activities of daily living. Suomi and Collier [25] investigated the effectiveness of two different *National Arthritis Foundation* (NAF) community-based exercise programmes: People with Arthritis Can Exercise (PACE) and The Arthritis Foundation Aquatic Programme (AFAP). The PACE on-land programme involved 72 range of motion (ROM), strength, endurance, balance and coordination, posture and body mechanics exercises that can be performed in sitting, standing, or supine positions. The AFAP consists of 72 range of ROM, strengthening, endurance, and mobility exercises to be performed in water. In both exercise groups, functional fitness showed significant improvements post 8-week intervention; flexibility (aquatic, 8.8%; on- land, 12.1%), eye-hand coordination (aquatic, 18.4%; on-land, 23.6%), and arm curl (aquatic: right arm, 21.4%; left arm, 20.2%; on-land: right arm, 17.7%; left arm, 21.5%) tests. In addition, the PACE group also significantly improved balance and agility (12.4%), but there was no difference for the aquatic group (5.5%). Increases may result from the physical activities practiced within each programme, for example, balance and coordination training was implemented into the PACE programme and not into the AFAP programme [22].

Studies have found strength exercises within a structured exercise programme enhance functional capacity in older adults [26, 27].

Seguin et al. [27] illustrated the positive effects of the 'Strong Women Program', which includes progressive resistance training plus balance training and flexibility exercises. Significant improvements were observed in all Senior Fitness Test measures for those aged 60 years and above; chair stand, arm curl, 2-minute step, 8- foot up and go [8UG], sit and reach and back scratch. Furthermore, the *EnhanceFitness* group exercise programme had very similar improvements on functional tests after 16 weeks [28]. Agility and dynamic balance is essential for tasks requiring quick manoeuvring such as getting up to answer the telephone, attending to tasks in the kitchen or getting out of a car [29]. Preserving the ability to complete these activities safely and efficiently enables an individual to remain independent in all aspects of daily life. Functional decline in fitness components can have serious consequences for the older adult through increased risk of falling. Lund and Jessen [30] assessed the effects of interactive activities on the mobility, agility, balance, and general fitness of community-dwelling individuals. Eighteen participants, aged 63-95 years, performed nine group sessions (1-1.5 hours each) of playful training with modular interactive tiles over a 12-week period. Improvements in various components of functional fitness were found with percentage increases of; 22.4% 6-minute walk test (6MW), 15% 8-foot Timed up & go test (8UG), 14% chair sit to stand. The measures of lower body strength, agility and dynamic balance and thought to be reliable for predicting future fallers and non-fallers among the community-dwelling population. Results suggest that PA involving a combination of sensory and motor-skills may be beneficial for reducing falls and the risk of falls in older adults.

Marigold et al. [31] studied the effect of two different community-based group exercise programmes on functional balance, mobility and falls in older adults following a stroke. Participants were randomly assigned to an agility (n = 30) or stretching/weight-shifting (n = 31) exercise group. After 10 weeks of the programme, 8UG results in the agility training group improved by an average of 17.3% and the stretching/weight-shifting group improved by an average of 7.6%. The Berg Balance test results showed an average improvement of 9.8% in the agility group and an improvement of 7.4% in the stretching/weight-shifting group. Even an exercise as simple as 8-weeks of calf stretching improved the dorsi-flexor range of motion and performance in several ambulatory tests in women, 65-89 years [32]. Fatouros et al. [33] investigated the effects of aerobic training, strength training and their combination on ROM of inactive older adults. Thirty-two participants, 65-78 years, were assigned to one of four groups; control [C], strength training [ST], cardiovascular training [CT], and combination of strength and aerobic training [SA]. The C and CT groups did not significantly improve, however the ST and SA increased sit-and-reach performance with improvements of 1.9 cm and 2.2 cm, respectively. A combination of exercise modalities elicited greater improvements in flexibility; a finding supported by other researchers [34-35]. Details of the studies included in this section are shown in Table 1.

Psychological health and social connectedness

It is long been know that regular PA is associated with varies psychological improvements for older adults including mental well-being, quality of life (QOL) and cognitive functioning assisting in 'healthy ageing' [36]. Crust et al. [37] evaluated the effects of single bouts of moderate intensity outdoor walking (60-90 min) on markers of psychological health. Findings revealed significant increases in self-esteem and positive affective states following group walks. Health-related QOL refers to a person's perceptions of their physical, cognitive, emotional and social functioning as well as perceptions of pain and vitality. Reid et al. [38] assessed the efficacy of moderate aerobic PA with sleep hygiene education to improve sleep, mood and quality of life in older adults with chronic insomnia. Participant 'vitality' domain improved substantially in the exercise group by 46% following the inter-

vention [38]. Going et al. [39] found that for frail older adults, PA can enhance emotional and social functioning without exacerbating perceptions of pain. These results were evident for both aerobic and flexibility training, however not resistance or balance training [39]. The findings imply that exercise can improve both physical functioning and mental well-being [40]. Exercise training interventions have been found to improve cognitive performance [41] and QOL [42]. Although the causal mechanisms are unclear, regular PA, particularly at moderate intensities can impact brain health with beneficial effects on cognitive domains such as memory, attention, and executive function [43, 44]. The results of randomised control trials highlight that exercise interventions of 6-12 months are often required before cognitive improvements are observed [44]. The degree of improvement may relate to individual progress and prescriptive detail of intervention intensity, frequency and duration. Indeed, Kirk-Sanchez and McGough [44] suggest that methods to facilitate long-term PA participation should be incorporated into the design of exercise programmes for older adults to progressively improve cognitive aspects. Lautenschlager et al. [45] evaluated the effects of a 24-week PA intervention (compared to usual care) on cognitive function in 170 older adults who reported memory problems and were identified as 'at risk' of Alzheimer's disease. PA was found to elicit modest improvements in cognitive function following an 18-month follow-up assessment.

Research on marital, parental and employment status suggests that an absence in any one of these major roles is negatively associated with psychological well-being [46]. Older adults often replace these major roles with alternate identities such as being a volunteer or a group-member [46]. Wallace et al. [47] found that a 12-week group exercise programme provided structure and support for older adults allowing them to form camaraderie and be 'around for each other'. The sense that an individual is 'needed' by others can be the difference between them feeling socially integrated or socially isolated [47]. Furthermore, pleasure associated with PA, has been related to exercise frequency, adherence, social support and group cohesion [48]. Once attending, the sense of support, belonging, social network and like-mindedness enhances participants' experience, and increases wellbeing [49, 50]. Importantly, sustained PA involvement is more likely if individuals are provided with the opportunity to be active with others in social or group situations rather than participating alone [51]. Social connections occur via the scenario of group-based exercise and this social structure is evident for supporting sustained PA adherence in older adults [51]. Group exercise has demonstrated positive effects on participants' subjective sense of wellbeing, fear of falling, self-efficacy for exercise and health related quality of life [50, 52]. Moreover, group-based exercise programmes for older people have shown mean long-term (≥1 year) adherence rates of 70% [53], which is positive for inducing adaptations. Additionally, this shows potential for the role of community-based group exercise in supporting older people to sustain PA beyond short-term means.

Many older adults, lack the knowledge and understanding of the relationship between PA and health; and negative experiences such as Physical Education in schools is a commonly cited barrier [48, 56]. It is therefore recognised that promoting the health benefits of PA to older adults may assist in encouraging activity and minimise sedentary behaviour. More challenging is combatting the stereotypes surrounding ageing and exercise, which are pervasive in society [57]. This includes assumptions and generalisations about how older adults should behave, without regard for individual differences or unique circumstances [58]. Stereotypes have been found to influence how older adults view themselves [59, 60] and how individuals view other older adults [59, 61]. The existence of these social norms and their acceptance among older adults could constitute a powerful influence on whether or not an older adult participates in regular PA and/or exercise [36]. Interestingly, partici-

Table 1. Studies included in the functional ability and independence section of the review.

Authors	Type of study	Reference listing number
Bouazziz et al. (2016)	Systematic Review	23
Taylor (2013)	Narrative/Literature Review	24
Sumoi & Collier (2003)	Randomised Control Trial	25
Belza et al (2006)	Observational Case Study	26
Seguin et al. (2012)	Observational Case Study	27
Fishleder et al. (2018)	Observational Case Study	28
Jones & Rikli (2002)	Expert Commentary/Opinion, Practice Guidance	29
Lund & Jessen (2014)	Observational Case Study	30
Marigold et al. (2005)	Quasi-experimental	31
Gajdosik et al. (2005)	Quasi-experimental	32
Fatouros et al. (2002)	Randomised Control Trial	33
Paterson et al. (2007)	Narrative/Literature Review	34
Seco et al. (2013)	Observational Case Study	35

Table 2. Studies included in the psychological health and social connectedness section of the review.

Authors	Type of study	Reference listing number
Chodzko-Zajko (2014)	Expert Commentary/Opinion, Practice Guidance	36
Crust et al. (2013)	Quasi-experimental	37
Reid et al. (2010)	Randomised Control Trial	38
Going et al. (2003)	Randomised Control Trial	39
Windle et al. (2010)	Systematic Review	40
Angevaren et al. (2008)	Systematic Review	41
Elavsky et al. (2005)	Randomised Control Trial	42
Chodzko-Zajko et al. (2009)	Expert Commentary/Opinion, Practice Guidance	43
Kirk-Sanhez & McGough (2014)	Narrative/Literature Review	44
Lautenschlager et al (2008)	Randomised Control Trial	45
Greenfield & Marks (2004)	Cross-sectional Survey	46
Wallace et al. (2014)	Quasi-experimental	47
Avers (2010)	Expert Commentary/Opinion, Practice Guidance	48
Dunlop & Beachamp (2013)	Qualitative Case study	49
Fox et al. (2007)	Quasi-experimental	50
Garmendia et al. (2013)	Randomised control trial	51
Hughes et al. (2009)	Randomised control trial	52
Farrance et al. (2016)	Qualitative synthesis	53
Keogh et al. (2014)	Qualitative Case study	54
Van Der Bij et al (2002)	Systematic Review	55
Schutzer & Graves (2004)	Narrative/Literature Review	56
Evans & Sleap (2012)	Qualitative Case study	57
Ory et al. (2003)	Narrative/Literature Review	58
Kotter-Gruhn & Hess (2012)	Randomised Control Trial	59
Levy & Myers (2004)	Longitudinal survey	60
Dionigi et al. (2011)	Qualitative Case study	61

pant's attitudes towards PA can be reformed through an appropriate exercise intervention [48]. Details of the studies included in this section are shown in Table 2.

The review's strengths and limitations

A limitation of the present review was the lack of consideration for some of the negative factors or any possible regressive elements physical activity may cause in this population group. To enhance knowledge, it is important to also explore the negative consequence of increased regular PA given that risk of induced injuries, pain and discomfort may be higher compared to younger adults. It is reasonable to suggest that the benefits of an active lifestyle outweigh any associated risks, assuming appropriate screening and supervision has taken place. A further limitation was the lack of rigidity which a systematic review may have explored. However, using a non-systematic design has allowed the authors to include a variety of research papers and their designs. This flexibility allowed the creation of the thematical exploration on the topic and the inclusion of many interventions and perspectives which holistically promote the array of benefits PA has for the older adult in a community context.

CONCLUSION

The primary components related to successful ageing are: 1) The absence of disease and disability, 2) the maintenance of physical and cognitive function, and 3) continued involvement in social activities [62]. This review illustrated that community-based group exercise programmes have been found to positively enhance older adult's physical function, improving mobility and flexibility. Despite these benefits, only 48% of men and 41% of women aged 65 years plus meet the PA recommendations [20] so many are not accruing the health benefits of an active lifestyle. Importantly, this review highlighted the important role PA plays in improving and maintaining older adult's lives, beyond just a physical existence. Indeed, reported social and psychological improvements are just as evident in the literature. This review managed to provide a holistic perspective on the benefit of PA for older adults whilst in summarising the literature in the area into two distinct dimensions. While prescription and community-based programmes for older adults vary in format and structure, the general concept should be to encourage as many individuals as possible to participate and adhere to PA [63]. PA should be group-orientated and activity sessions need to promote social connectedness. Enjoyment, pleasure and other connected psychological benefits are likely to influence sustained participation. This may be achieved through maximising facilitators and minimising barriers between older adults and PA participation [64] and perhaps by challenging stereotypes and social norms which exist with older people and exercise. Evidently, engaging in PA produces positive improvements in older adult independence, functional ability and cognition and this can occur through a range of activity types which should be encouraged to this population group. In this light, the review has the following concluding statements and recommendations for those involved in prescribing and programming exercise for older people in future research studies or promotion programmes in the community:

PA improves functional ability, independence, psychological health and social connectedness.

Promoting the health benefits may assist in encouraging older adults to become active and minimise sedentary behaviour.

While community-based programmes vary in format and structure, the general concept should be to encourage as many older adults as possible to participate and adhere to PA.

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