

Psychological and Environmental Factors for Older Adults to Exercise: A Systematic Review

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Abstract

Research investigation concerning potential motivators and psychological influences on health and physical exercise participation have increased worldwide in the last two decades. In contrast, few investigations have analysed this phenomenon in older people living in different contexts. Older adults suffer a notable diminution of physical functions that may be followed by psychological disorders and are detrimental to their affective and social relationships. Therefore, it is of great importance to find strategies that increase the participation of older adults' in regular exercise. A systematic review of 945 studies was conducted. All of the 27 studies reviewed, that met the inclusion criteria, have undertaken mixed-method, qualitative and quantitative approaches. The data were extracted based on the following variables: the methodology and the instrument/questionnaire used, the type of article, number of participants, duration and intensity of the interventions, profile of the older adults, most relevant findings and the country where the study was developed. The instruments used in the studies, were mainly semi-structured interviews, discussion groups and questionnaires, focusing mainly on the United States and Canada. The knowledge of psychological and environmental factors is a key aspect relevant to both the social and physical aspects and has a strong influence on older people's commitment to exercise, influencing their wellbeing. The aim of this study was to explore barriers and facilitators of adherence to a physical exercise programme for older adults.

Keywords: motivation; environment; exercise; older adult.

Introduction

Investigation concerning potential motivators and psychological influences on health and physical exercise participation have been increased worldwide in the last two decades. In contrast, few investigators have analysed this phenomenon in relation to older people living in several contexts (Annear et al., 2014). Physical exercise has a range of mental health benefits, including reduction in the symptoms of anxiety (Dunn and Jewell, 2010) and depression (Hallgren et al., 2016) as the most common mental disorders in this population. Moreover, physical exercise has a variety of health benefits including the reduction of metabolic syndrome (Warburton, Nicol, and Bredin, 2006), the risk of falls among this population (Ii et al., 2007), type 2 diabetes, heart disease, high blood pressure and stroke (Warburton et al., 2006). Older adults suffer a notable decrease in physical functions that can be followed by psychological disorders with a detriment to affective and social relationships (Hsu et al., 2014). Therefore, it is of considerable importance to find strategies in order to increase the participation of older people's in regular physical exercise (Kosma and Cardinal, 2016).

Motivation influences behaviour when considering physical exercise. Older people are a particular population and have unique motivations and perceptions in their day-to-day lives about joining in physical exercise activities (Krug, Barbosa, Monego, Mello, and França, 2015). Facilitators argue the value to health and well-being of physical exercise experiences that feel useful, beneficial, pleasurable and socially recognised (Schutzer and Graves, 2004). However, older adults' motivation may be weakened by different elements. Among them are little support from equals and family members as well as ageist stereotypes and prejudices that consider this group as incapable of exercisers due to frailty, strengthening the idea that inactivity and loneliness are an inevitable consequence of ageing (Brawley, Rejeski, and King, 2003).

Older adults are influenced by the neighbourhood environments (Park et al., 2019; Rasinaho, Hirvensalo, Leinonen, Lintunen, and Rantanen, 2007) so that mobility and independence can be significantly restricted by a poorly designed area (Arango, Páez, Reis, Brownson, and Parra, 2013) and weather conditions (Aspvik et al., 2018). For instance, older adults are more physically active when

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their local environments have a variety of walking paths and give a sense of security (Hall and McAuley, 2010). A review showed that a neighbourhood environment (i.e., well connected areas) facilitated to physical exercise in older adults (Schutzer and Graves, 2004b). Psychological factors are also assessed in the present work trying to elucidate the relevant psychological facilitators to encourage physical exercise in later life. Physical, social, cultural, psychological, spiritual and cultural activities are the variables outlined by the World Health Organization (World Health Organization, 2002) in its active ageing guideline. Environmental and psychological factors can present several barriers to a commitment to physical exercise which could ultimately influence health outcomes. It is relevant to bear in mind promoting physical activities that older people like as well as facilitating factors, perceived barriers and benefits from physical exercise (VanBeveren and Avers, 2012). These elements, may help in creating and developing interventions that foster exercise and adherence to a healthy lifestyle in this age group.

This study conducts a systematic review of articles published since 1990 concerning the potential impact of psychological and environmental factors on health and participation in physical exercise in later life. A systematic review is an assessment of published evidence based on expressed enquiries that employs systematic and explicit methods to select, find and critically appraise significant primary research (Bidwell et al., 2001). In the present review, older adults are the participants under investigation and are described as persons aged 50 years or older. The health-associated gerontological research containing review studies focused its attention on the physical influences of health and activity, leaving aside the experiences, motivations and environmental demands of this cohort in order to facilitate physical exercise practise (Annear et al., 2014). The existing literature has also focussed its efforts on the evaluation of empirical and quantitative research outcomes, with little regard to qualitative ones.

According to predetermined criteria for systematic review procedures, the present study promulgates a variety of questions: what investigations exist and analyse potential motive correlates in order to facilitate exercise participation among this population? Do the psychological and environmental factors affect the participation of older adults in exercise? What methodological approaches have been employed to investigate relationships between psychology factors, environment, ageing and participation in exercise? What are the most important facilitators to encourage older people to join in physical exercise activities? What are the most cited recommendations when planning physical exercise programmes oriented towards older adults? The aim of this study was to explore barriers and facilitators of adherence to a physical exercise programme for older adults, taking into account the psychosocial and environmental factors, in order to gain better insight into factors that may predict commitment to intervention.

Methods

The systematic review process developed in this paper follows the guidelines established by the Cochrane collaboration (Higgins and Green, 2011). The Cochrane-type review procedure has been used to provide a valid and systematic process for identifying studies about motives in older adults' physical exercise practise from within a vast number of diverse articles, which are part of large body of literature. Taking into account the Cochrane review procedure, this paper varies it in a number of ways: 1) the review includes qualitative, quantitative and mixed-method research, which is not common in this type of study; 2) the review does not assess the effectiveness of an intervention, but focuses on fields related to physical exercise, motives, ageing and activity participation; 3) the work tries to recognize gaps in the body of knowledge in order to set the basis of a subsequent study of the older adults' motives to practise physical exercise.

Search strategy

Firstly, we looked for existing reviews published in the past 15 years that have evaluated the interrelationships between psychological factors of exercise and ageing in different contexts. Once this information was known, it was used in the present review to develop its scope. No evidence of review articles was found that dealt on with the subject described above. Furthermore, few reviews concentrated completely on older people.

Two main search strategies were used. The first step consisted of a search in two electronic databases, Science Citation Index Expanded by Institute for Scientific Information (ISI)-Thomson Reuters and Scopus (Elsevier). We analysed all peer-reviewed publications in the period between 1990 and 2020. Searches were developed within the databases described above and were based on combinations of the following search terms related to 'physical exercise' (physical exercise, physical activity and exercise), 'elderly people' (elderly, elders, older adults, senior adults and seniors), and 'motives' (motive, motivation, intention, reason and attitude). Finally, the so-called *grey literature* searches (analysing the reference lists from relevant articles, also known as the snowballing technique) were used to find further relevant papers not identified during the previous searches. If a paper found in this process was chosen, it was verified to be peer-reviewed. Once every relevant article was found, it was evaluated according to inclusion criteria. Then, the researchers assessed the methodological quality using a predetermined quality assessment process consisting of rating each study according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009)

Inclusion/exclusion criteria and quality assessment

Three general criteria were assessed in the selection of the review of the literature: for action, quality and relevance. Articles that did not fulfil previous criteria were not

included. The criterion to determine the methodological quality of the selected articles was performed according to the (PRISMA) guidelines and its checklist (Moher et al., 2009). Two independent experts conducted the scoring and discrepancies were settled by a third reviewer. Accordingly, the review team in charge of developing this study, conducted the work of expounding and choosing items through strict compliance with the standards set forth above. Those responsible for this assessment are members of various universities and research centers with expert knowledge of work on older adults and research on physical exercise in the area of physical health and sport sciences.

The data examined from each paper were previously designated and each fellow of the review team contributed to the final discussion, if any doubts or discrepancies emerged among authors, they were presented to an external expert researcher, with wide experience in the studied field. Any inconsistencies were conciliated with careful deliberation and clarification by the rest of the review team. Data concept, organization, and quality assessment of each article were independently developed by two authors (peer review process) and, any inconsistencies were conciliated by a third reviewer.

Secondary inclusion/exclusion criteria addressed which studies should be reviewed under the following items: 1) including participants aged 50 years or older that are involved

in physical exercise programmes and their motivation for maintaining exercise practice in order to improve their quality of life and psychological well-being; 2) referring to exercise and psychological behaviours according to World Health Organization's WHO (2002) active ageing concept is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age; and 3) undertaking qualitative, quantitative or mixed-methods research approaches. The review team responsible for developing this study carried out their work conscientiously obtaining a major breakthrough with the three criteria set above. They are expert in health, active ageing and psychological behaviours applied to physical exercise in older adults.

Results

Study selection

The initial search of the two databases yielded 934 potentially relevant articles (see Figure 1). Searches of the *grey literature* yielded an extra 17 articles of interest. After assessing both databases and examining titles, keywords and abstracts in relation to the criteria set out above, the potential studies list was significantly reduced to 187. Once the inclusion

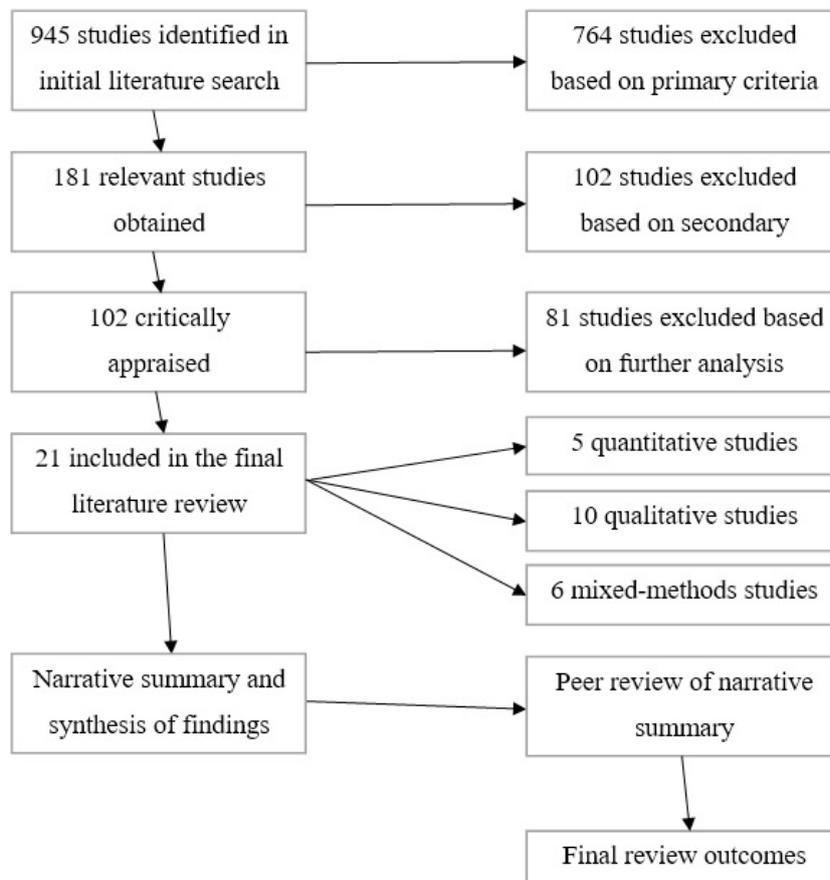


Figure 1. Research flowchart

and exclusion criteria were applied, the sample of articles was reduced to 108. potentially chosen articles identified as a result of the search strategy and criteria assessments. These were sent to two reviewers to ascertain whether the compilation had been in accordance with the described criteria. After all, relevant articles had been selected and the assessment process peer reviewed, outstanding studies were evaluated against a further analysis. An external expert in the present subject of study rated each study from 0 to 3 in order to assess the level of scientific rigour applied. Rating approaches were adapted from current review methods (Stevenson, Pearce, Blakely, Ivory and Witten, 2009; Yen, Michael and Perdue, 2009). After assessing all the studies, 8 were not included as the abstracts did not provide useful information for the review. Moreover, 38 were excluded as

they were not aimed at the physical exercise of older adults; 14 did not consider the motivators of the physical exercise population ; 1 study was identified as having a lower level of quality and was omitted; and 78 were found twice in the same database or in the other. The final systematic review, consequently, draws on 27 of the most relevant articles found during the systematic review process (Table 1).

The overview of all articles that met the inclusion criteria for this review is shown in Table 1. These articles were classified in terms of the methodology and instrument/questionnaire used, the type of article, the number of participants, duration and intensity of the interventions, profile of the study subjects, most relevant findings and the geographical distribution.

Table 1
Psychological and environmental facilitators research publications (n = 27)

Article/ authors	Type of study	Duration and/or intensity	Number of older people	Profile of the subjects	Instrument/Questionnaire	Findings	Country
Wilcox et al., (1996).	Mixed	One-day event	102	Healthy elderly people (HEP)	PASE Self-efficacy for physical activity Social support for physical activity Physical activity decisional balance GDS Open-ended questionnaire	Interventions with older rural women should focus on working with families, communities, and health care providers to support PA.	USA
Aronson and Oman (2004).	Cualitative	6 sessions	26	HEP	Focus groups	The characteristics of the rural environment can be summarized as (1) features of the available settings (2) the scarcity of indoor facilities where seniors can engage in PA.	USA
Thomlinson et al., (2005).	Cualitative	-	55	HEP	A semi-structured interview	Residents felt it important to be viewed by professionals as a whole person, rather than as a disease entity. Regardless of residents' age or condition, they desired and felt entitled to be treated with respect. Residents felt it important to be viewed by professionals as a whole person, rather than as a disease entity. Regardless of residents' age or condition, they desired and felt entitled to be treated with respect. Residents felt it important to be viewed by professionals as a whole person, rather than as a disease entity.	Canada
Schoster et al., (2005).	Cualitative	8 weeks	51	HEP	A semi-structured interview	The instructor role was key in sustaining the participants' motivation to exercise.	USA
Dye and Wilcox, (2006).	Cualitative	-	28	HEP	Focus groups	Factors such as previous experience, observational learning, outcome expectations (positive and negative), self-efficacy and social support emerged as important themes.	USA
Hopkins et al., (2007).	Cualitative	Averaged 45 minutes in length, each interview	15	HEP	A semi-structured interview	Importance of preventing illness and in maintaining body strength and mobility into the later stages of life.	USA
Witcher et al., (2007).	Cualitative	45 and 90 min each interview	10	HEP	A semi-structured interview	The participants will most likely demonstrate a willingness to participate in activity that is deemed relevant and suitably purposeful or productive.	Canada

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Article/ authors	Type of study	Duration and/or intensity	Number of older people	Profile of the subjects	Instrument/Questionnaire	Findings	Country
Tompkins et al., (2009).	Mixed	One day conference	359	HEP	The Exercise Evaluation Inventory	Safety precautions were emphasized as recommendations for older adults. Recruiting other individuals such as family, peers, or professionals was accentuated to assist with exercise adherence for older adults. One study with older adults indicated time constraints overall continue to be an overwhelming barrier for exercise counseling with all populations (Melillo et al., 2000). Safety precautions were emphasized as recommendations for older adults.	USA
Wu et al., (2009).	Cualitative	4 sessions (90-120')	67	HEP	Focus groups	Women readily endorsed social engagement as a requirement for aging well, whereas men voiced reluctance to attend functional activities.	USA
Grant-Savelle, (2010).	Mixed	3 months	197	HEP	PASE	Older adults in rural and remote areas did not see social contact as a facilitator, whereas older Australian adults did.	USA
Graham and Connelly (2013).	Cualitative	60 and 90 min each audio-taped interview	17	HEP	A semi-structured interview	Prescribing exercise for older adults may be effective if the focus is on enjoyable and previously experienced physical activity.	Canada
Waites, (2013).	Mixed	3 months	32	HEP	GIS Focus groups and questionnaire.	Some seniors had difficulty staying motivated to maintain a healthy lifestyle.	USA
Yeom and Fleury, (2013).	Cuantitative	12 weeks	64	HEP	SES ISR 6MW SPPB	Social support from family and friends; behavioral change process variables, including self-efficacy; motivational appraisal; and self-regulation.	South Korea
Strand et al., (2014).	Mixed	25-week pilot study	46	HEP	PAR-Q ACPAQ Self-reported physical activity participation "Do you currently engage in regular physical activity?"	Best-liked features were physical activity and socialization.	USA
Agha et al., (2015).	Cualitative	Six months	32	HEP	Group and individual interviews	Health conditions associated with pain and fatigue may be a barrier. In addition, Social support from family and friends was identified to facilitate adherence.	Canada.
de Rosso Krug et al., (2015).	Cualitative	-	36	HEP	A semi-structured interview	Personal aspects of coexistence and motivation, are factors cited as facilitators for the practise of physical activities, while the barriers are related to health, unwillingness, and age.	Brazil
Lee and Park, (2015).	Cuantitative	-	437	HEP		Overall, for rural women, proximity to parks was the strongest positive facilitator. For urban women, crime safety was an important environmental variable.	South Korea
McMahon et al., (2015)	Cuantitative	8-week Ready~Steady intervention.	28	HEP	- CHAMPS - SPPB - SSES - PESS - GAS - IR - ISR	Many participants refined their goals; identified tools and strategies to support their goals and plans.	USA
Tate et al., (2015).	Cuantitative	-	137	HEP	- YPAS - MCQ - BRFS	The results indicated that exercising older adults display lower temporal discounting rates than no exercising older adults.	USA
Kosma and Cardinal, (2016).	Mixed	Data collection lasted 1 year	140	HEP	Physical activity beliefs. Six open-ended questions. - PASE	The most common physical activity disadvantages and barriers were falls, injuries, pain, and health issues. Common physical activity supporters were family members, friends and peers, and health-care professionals.	USA

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Article/authors	Type of study	Duration and/or intensity	Number of older people	Profile of the subjects	Instrument/Questionnaire	Findings	Country
Lang et al., (2016).	Cuantitative	18-session 9-week IWEP	232	HEP	- MOS-SF-36	Participants' level of motivation impacted more the absolute benefit than social, financial, professional, and/or health data.	France
Kosteli et al., (2016)	Cualitative	-	37	HEP	7 Focus groups	Findings highlighted the importance of social support, positive outcome expectations and self-regulatory strategies as motivators. PA provided a sense of purpose in the lives of retired individuals.	England
Lindsay-Smith et al., (2018)	Mixed	12-months	35 (survey) 11 (focus groups)	HEP	2 Focus groups Active Australia Survey. Short form 12-item Health Survey Questionnaire version 2 (SF-12). Sociodemographic survey	Community PA programs appear to maintain PA levels and physical HR QoL in older adults, and both social and PA programs may maintain mental HR QoL. Incorporating both types of program into one organisation may also encourage less physically active members to try physical activities.	Australia
Park et al., (2019)	Cuantitative	-	87	HEP	Psychological Need Satisfaction in Exercise Scale. The Behavioural Regulation in Exercise Questionnaire-2. Assessing Levels of Physical Activity scale. Objective PA was measured using an accelerometer. Autonomy support was measured using Williams et al.'s (2006) scale.	Results showed participants in the highly self-determined and supported profile engaged in higher levels of light PA and moderate-to-vigorous PA than participants from other profiles. Findings showed perceptions of the neighbourhood environment should be taken into account with motivation regarding PA.	England
Samra et al., (2019)	Cualitative	-	Six groups	HEP	6 Focus groups	Participants were interested in exercise groups and physical activity programs tailored to their existing physical health. The majority of participants reported preferring to be active with others.	Australia
Steltenpohl et al., (2019)	Cualitative	-	39	HEP	8 Focus groups	Consistent with SST, older adults preferred to exercise with others. Additionally, older adults tend to consider peripheral others (e.g., strangers, acquaintances), as a positive rather than a negative influence.	USA
Parra et al., (2019)	Cualitative	18-months	41	HEP	5 focus goupes	Older adults indicated that the mindfulness training increased their awareness and self-reflection and fostered a more self-accepting attitude. The main barrier was time management. The social benefits and sense of community were some of the primary motivators for older adults.	USA

Study characteristics

Evolution of impact publications and geographical distribution

Bearing in mind the year of the article's publication, there is an identifiable pattern in terms of the increasing interest related to this subject as time goes by. In this context, the most prolific year is 2015 (18, 51% of the sample) and 2019 (14, 81%) followed by 2013 (11, 11%) and 2003, 2007, 2009, and 2016 with 2 publications each, as shown in Figure 2. In this regard, half (51.85%) of the whole sample has been published in the last five years. On the other hand, there are three years (2008, 2011 and 2012) with no publications relevant for the present review. Other years appear with at least one paper published that achieved the inclusion criteria set above. The proliferation

of publications over time and their constant appearance can be observed despite the variation of the number of articles published each year.

Research from the United States of America and Canada (North America) dominated the review sample with 70.37% of the literature reviewed. Limited numbers of research papers from other regions were found. Apart from the aforementioned, the rest of the articles do not follow any pattern. For instance, in Europe, there is one developed in France (Lang et al., 2016) two in England (Kosteli, Williams and Cumming, 2016; Park et al., 2019), two that were written in Asia, particularly, in South Korea (Lee and Park, 2015; Yeom and Fleury, 2014) and another in South America, Brazil (Krug et al., 2015). Finally, two were developed in Australia (Lindsay-Smith, O'Sullivan, Eime, Harvey and Van

Uffelen, 2018; Samra et al., 2019) The results from Europe, Africa, South America and Asia are limited in comparison

with North America, probably due to the use of English as the language chosen in this review.

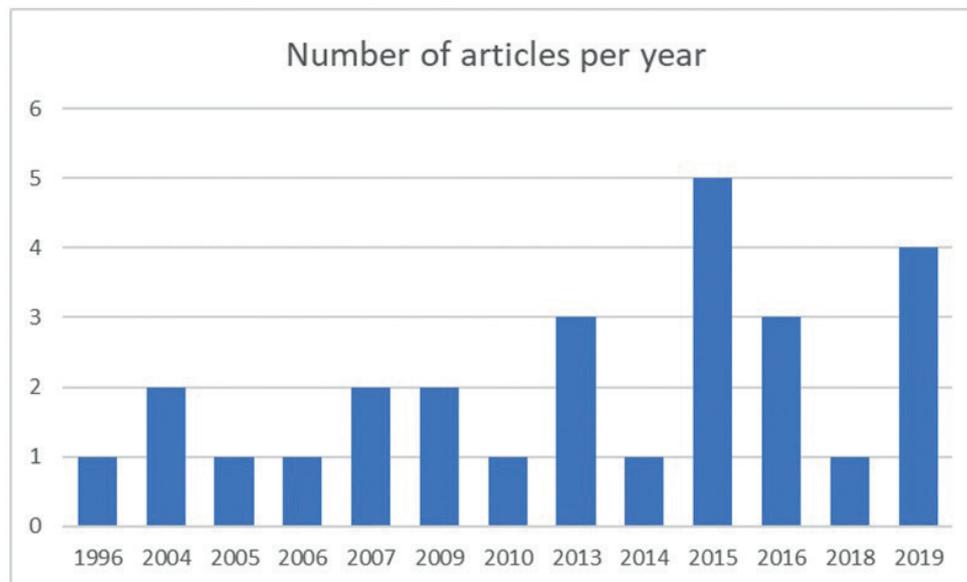


Figure 2. Number of articles by year of publication

Profile of the participants.

Twenty three studies of the 27 that have been examined were conducted with mixed samples, even though three of these seventeen studies have mainly women participants (>90%, (McMahon et al., 2015; Schoster, Callahan, Meier, Mielenz, and DiMartino, 2005; Tompkins, Practitioner, Belza, and Aljoya, 2009). Moreover, four studies were undertaken solely with older women (Dye and Wilcox, 2006; Hopkins *et al* 2007; Lee and Park, 2015; Wilcox *et al* 1996). With regard to the participants' age, a few studies determined a minimum age limit of 50-60 years for inclusion in the research, sixteen studies used an age limit between 60 and 70 years, while two studies included adults aged 70 years or older. Three studies used include people up to 90 years of age or less and two studies did not determine an age limit for inclusion. A chronological marker was used in all of the studies evaluated in this review to delineate their research participants. All studies (27) were conducted with community dwelling participants with no physical or cognitive impairment and the ability to exercise.

Research design and methods

Qualitative approaches predominated in the reviewed research studies. There were 7 articles with mixed-method approaches and even fewer quantitative studies located via the search procedure. Of the 27 articles assessed, fourteen were qualitative, seven developed mixed-methods and six used quantitative approaches. The current research design in relation to the identified quantitative studies was cross-sectional (N=3), cohort or longitudinal studies

(N=1), randomised controlled trials (N=1) and quasi-experimental studies (N=1). The higher appearance of cross-sectional research may be associated with the huge number of experimental purposes and hypotheses, which is consistent with the comparative novelty of the field of older people's psychological factors related to physical exercise adherence.

Study participants were selected in a variety of ways: strategies such as systematic sampling, purposive sampling and random sampling approaches were used. Surveys were conducted by using interviews and questionnaires (via telephone or face-to-face) and research concerning physical exercise facilitators on older adults' activity participation prevailed.

Data collection instruments

The instruments employed to gather the information are worth mentioning. On the basis of the aforementioned, 13 studies (48, 14%) used questionnaires to collect the data. It is noteworthy that there are several instruments focused on diverse aspects of human beings. For instance, seven studies assessed the physical activity level with the Physical Activity Scale for the Elderly (PASE), being the most frequently used questionnaire (N=3, (Grant-Savelle, 2010; Kosma and Cardinal, 2016; Wilcox et al., 1996). Three studies evaluated older people's social support for physical activity, using two the Social Support and Exercise Survey (SSES, McMahon *et al.*, 2015; Yeom and Fleury, 2014). Psychological factors, such as decisional factors (Tate, 2015), depression (Wilcox et al., 2003), self-regulation

(Yeom and Fleury, 2014), goal attainment and physical exercise readiness (McMahon et al., 2016), stages of change for physical activity (Strand, Francis, Margrett, Franke, & Peterson, 2014), environmental support (McMahon et al., 2016; Park et al., 2019) and mental health (Lang et al., 2016) were also assessed employing several questionnaires. On the other hand, one study (Yeom and Fleury, 2014) evaluated older adults' physical fitness developing physical activity tests (6-Minute Walk and the Short Physical Performance Battery). Where qualitative research approaches were developed, (it did not matter whether independently or mixed with other instruments), focus group discussions were used as the most common method (N=9) followed by semi-structured interviews (N=7, Aronson and Oman, 2004; Dye and Wilcox, 2006; Waites, 2013; Wu *et al* 2009).

The assessment of the literature shows how the evolution of impact publications follows a progressive increase, being an emerging topic in recent years. This fact may represent the relative innovation of investigation in the area. It is also important to note that investigations based on mixed methods which link the quantitative approach with the qualitative one have an important value in this research area (Annear et al., 2014). In this context, the principal instruments employed to gather the information from older peoples' studies are questionnaires, semi-structured interviews, surveys and group discussions regarding research studies and outcomes analysis. According to Annear *et al.*, (2012), there is a lack of research from Asian and African countries because the majority of the investigations have been developed in North America. Considering the contribution of Europe to this area, few studies have been found and reviewed. Hence, the necessity for increasing the studies developed in Europe emerges. These authors identified that most of their reviewed studies were carried out in North America, a result that follows the tendency found in the present review.

Discussion

This study aimed to explore the factors of adherence to physical exercise programmes for older adults. During the review process, several studies described some guidelines to bear in mind when planning physical exercise programmes for this population. This population's health and physical exercise participation was extremely connected by a synergy of both environmental and personal aspects (Franco et al., 2015). First of all, it has been shown that different elements in the physical environment influence the physical practice and mobility of older adults when choosing the option of walking along paths, for example, neighbourhood care, access to public spaces and the proximity of the facilities, have shown that they positively affect the physical practice and behaviour of this population group for health purposes (Gebel, Bauman, Owen, Foster, & Giles-corti, 2009; Kosteli et al., 2016). The literature review suggests that older adults prefer pleasant weather conditions when they are active. Importantly, the

impact of weather should not be ignored when planning public health strategies to increase physical practice among older adults, especially for those who are not active.

Environmental facilitators that have been connected with physical exercise participation among older people are varied and include better perceived safety of their own neighbourhood, facilitated walking assemblies, neighbourhood watches, protection from traffic and traffic control (eg., diminishing speed limits, (Wilcox et al., 2003)). In addition indoor facilities where older adults can join in physical exercise activities, good weather conditions, problem-solving safety concerns, easier entry to amenities, pedestrian-friendly walking environments, attractive and safe footpaths, existence of parks close to one's neighbourhood, crime safety, easier access to activity programmes and reliable public transportation (Aronson and Oman, 2004; Kosma and Cardinal, 2016; Lee and Park, 2015; Tompkins et al., 2009; Waites, 2013; Wilcox et al., 1996) are all major factors in promoting physical activity.

Environment can be a potential facilitator for exercise participation in older people (Schutzer and Graves, 2004). Environmental factors that were predominantly evaluated as having potential impact on exercise participation included neighbourhood safety (Lee and Park, 2015), walkability or pedestrian friendliness (Waites, 2013) and weather and attractive topography (Tompkins et al., 2009), as the most valuable environmental facilitators for exercise in older people. Their exercise participation and wellbeing is extremely connected by a synergy of both environmental and personal aspects.

Secondly, some of the most reliable findings include targeting the benefits for older adults, working with families, friends and health care providers (Horne, Skelton, Speed and Todd, 2012; Lindsay-Smith et al., 2018). Special effort should be focused on methods of recruiting the right instructors to maintain older people's motivation (Aro, Agbo and Omole, 2018), with previous experience and motivation from older adults to join physical exercise programmes that, address their illnesses and try to keep their body strength and mobility (Bangsbo et al., 2019). It should include more common leisure-time physical activities, consider gender according to health beliefs, behaviours and create interventions based on specific populations, use strategies that enable older adults to customize their personal goals and control their progress. Interventions should focus on efforts to motivate and to teach them how to manage the information related to their health, physical exercise practise and well-being (Agha *et al.*, 2015; Dye and Wilcox, 2006; Graham and Connelly, 2013; Grant-Savela, 2010; Hopkins *et al.*, 2007; Kosma and Cardinal, 2016; Krug *et al.*, 2015; Lang *et al.*, 2016; Lee and Park, 2015; McMahon *et al.*, 2015; Schoster *et al.*, 2005; Tate, 2015; Wilcox *et al.*, 1996; Witcher *et al.*, 2007; Wu *et al.*, 2009).

Due to the complicated relationship between the potential variables related to behavioural change, most of the barriers to exercise can also be understood as

facilitating exercise participation (Cohen-Mansfield, Marx and Guralnik, 2003). Therefore, it is elemental to understand the cognitive processes related to behavioural change and exercise commitment. Several articles reviewed in this paper have shown self-efficacy to be a basic essence in this process. It is usually defined as a relevant factor in exercise behaviour in different populations and a large number of types of behavioural learning in the literature (Schutzer and Graves, 2004) playing a determinant role in Bandura's social cognitive theory (Bandura, 1978). Strong self-efficacy beliefs and outcomes will help people to begin and persevere with a specific behaviour. Moreover, self-efficacy implies a consequently strong influence on the exercise behaviour of older people (Brassington, Atienza, Perczek, DiLorenzo and King, 2002). Another variable in psychological facilitators, namely, social support, also appears in the majority of the studies and was identified as promoting exercise participation (Agha et al., 2015). Social support may be determined by family members (Kosma and Cardinal, 2016), equals (Yeom and Fleury, 2014) and friends (Tompkins et al., 2009).

Limitations

While standards were critically appraised in this review to ensure that findings were examined systematically, there are a variety of limitations that should be mentioned. There is a scarcity of recognised frameworks for developing a systematic review containing mixed-methods, qualitative and quantitative articles. This review is based on the Cochrane review procedures (Higgins and Green, 2011), which is commonly used to evaluate quantitative approaches. As a result, some readers may disagree, thinking that outcomes from qualitative and quantitative articles are not directly comparable. It was necessary, nevertheless, to assess both quantitative and qualitative findings in order to provide full information about existing knowledge of the relationship between motivational and environmental facilitators, ageing and exercise participation.

An additional limitation in the present review is that, perhaps, some studies have not been included as a consequence of the databases chosen. Some databases were not taken into account during the search process, which is a significant limitation. Despite this limitation, large impact articles have been reviewed and evaluated as part of the present review (more than 900 primary research studies first searched), which entailed a significant diversity of literature in existence, addressing relevant facilitators of exercise for older people over the past 26 years. Further research is necessary expanding the databases selected and

the language used to identify the nature of the relationships between psychological and environmental conditions, ageing and exercise participation.

Conclusions

To conclude, it is necessary to add more and deeper research into the relations between exercise facilitators and ageing since few studies have been developed in this field. In the context of the present systematic review, most of the studies have indicated that psychological and environmental factors play a relevant role in promoting exercise participation in older people. Some factors appear to be a barrier when older adults try to join physical exercise programmes, whereas others appear to positively influence their engagement and wellbeing (Schutzer and Graves, 2004). Exercise promotion interventions may be multidisciplinary and should take into consideration previous purposes and experiences, personal aspects, environmental conditions, motivation and tailored prospective outcomes for this population (Krug et al., 2015; Lee and Park, 2015). Moreover, mixed-methods and qualitative approaches are sometimes lacking and are required to understand the multiple pathways and procedures through which motivation and environmental conditions may control the participation of older people in exercise. In regard to the facilitators, motivation and environmental conditions have appeared as the most important elements when planning interventions aimed at older people's physical exercise participation (Annear et al., 2014). These approaches would help to develop new ecological theories about ageing and facilitators for exercise (Moreno Doña, Rivera García and Trigueros Cervantes, 2014). More determinants of exercise participation, other than physical exercise, need to be assessed in the research literature in order to succeed in creating physical exercise programmes for older adults, especially for those who live in rural areas (Annear et al., 2014).

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Factores psicológicos y ambientales para que los adultos mayores hagan ejercicio: una revisión sistemática

Resumen

Las investigaciones sobre los posibles factores motivadores e influencias psicológicas sobre la salud y la participación en el ejercicio físico han aumentado en todo el mundo en las últimas dos décadas. En contraste, pocas investigaciones han anali-

zado este fenómeno en adultos mayores que viven en varios contextos. Los adultos mayores sufren una disminución notable de las funciones físicas que pueden ser seguidas por trastornos psicológicos y un detrimento de las relaciones afectivas y sociales. Por lo tanto, es de suma importancia encontrar estrategias para aumentar la participación regular de los adultos mayores en prácticas de ejercicio físico dirigido. Se realizó una revisión sistemática de 945 estudios. Todos los 27 estudios revisados, que cumplieron con los criterios de inclusión, han adoptado métodos mixtos, cuantitativos y cualitativos. Los datos se extrajeron de acuerdo con las siguientes variables: metodología científica, el instrumento / cuestionario utilizado, tipo de artículo, número de participantes, duración e intensidad de las intervenciones, perfil del colectivo de adultos mayores, los hallazgos más relevantes y el país donde se realizó el estudio. Los instrumentos utilizados en los estudios fueron principalmente entrevistas semiestructuradas, grupos de discusión y cuestionarios, centrados principalmente en Estados Unidos y Canadá. El conocimiento sobre los factores psicológicos y ambientales es un aspecto clave que se encuentra adyacente tanto a los aspectos físicos como a los sociales y tiene una influencia relevante en el ejercicio y el bienestar de los adultos mayores. El objetivo de este estudio fue explorar las barreras y los facilitadores a la hora de realizar un programa de ejercicio físico para adultos mayores.

Palabras clave: motivaciones; medio ambiente; ejercicio; adulto mayor.

Fatores psicológicos e ambientais para o exercício de adultos mais velhos: uma revisão sistemática

Resumo

Pesquisas sobre possíveis fatores motivadores e influências psicológicas na saúde e participação em exercícios físicos aumentaram em todo o mundo nas últimas duas décadas. Por outro lado, poucas investigações analisaram esse fenômeno em idosos que vivem em vários contextos. Os idosos sofrem uma diminuição notável nas funções físicas que podem ser seguidas por distúrbios psicológicos e um prejuízo para as relações afetivas e sociais. Portanto, é de extrema importância encontrar estratégias para aumentar a participação regular de idosos em práticas direcionadas de exercícios físicos. Uma revisão sistemática de 945 estudos foi realizada. Todos os 21 estudos revisados, que atenderam aos critérios de inclusão, adotaram métodos mistos, quantitativos e qualitativos. Os dados foram extraídos de acordo com as seguintes variáveis: metodologia científica, instrumento / questionário utilizado, tipo de artigo, número de participantes, duração e intensidade das intervenções, perfil do grupo de idosos, achados mais relevantes e país onde o estudo foi realizado. Os instrumentos utilizados nos estudos foram principalmente entrevistas semiestructuradas, grupos de discussão e questionários, focados principalmente nos Estados Unidos e no Canadá. O conhecimento de fatores psicológicos e ambientais é um aspecto fundamental, adjacente aos aspectos físicos e sociais, e tem uma influência relevante no exercício e no bem-estar dos idosos. O objetivo deste estudo foi explorar as barreiras e facilitadores na realização de um programa de exercícios físicos para idosos.

Palavras-chave: motivações; ambiente; exercício; idoso.

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