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Original Article

Quality of life and subjective well-being of physically active elderly people: a systematic review

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Abstract:
As the life expectancy of the world population increases, debates about the aging process also spark off. However, studies that focus on the role of physical exercises on the quality of life and on the subjective well-being of older seniors are still lacking. The reason may be because most of these individuals get to this stage without any being able to practice physical exercises. As a result, a systematic review of the literature was performed in order to identify and analyze the effects of the practice of physical exercises on the quality of life and on the subjective well-being of older seniors. It was also intended to verify the most common measurement instruments that evaluate these constructs, as well as the set of variables that are associated with them. The search was performed in databases such as PubMed, Scopus and BVS, during 2012 and 2017, by using descriptive terms like "quality of life," "subjective well-being," "aged," "aged 80 and over," "exercise," and "physical activity." There were found 7,324 studies, out of which 22 randomized controlled clinical trials were chosen for investigation. Consistently, these studies indicate positive results of the practice of physical exercises on the variables of interest. Most of the studies evaluated the quality of life through a measurement instrument, The Medical Outcomes Study 36-item short-form health survey (SF-36) being the most frequent. Among the results that investigate subjective well-being, only one of them uses a specific instrument, the 5-Item Satisfaction with Life Scale. Among the variables that can impact on the quality of live and the subjective well-being of older seniors, sex, age, and the risk of falling stand out. Furthermore, scientific gaps were identified and discussed. Further studies should focus on homogeneous samples to evaluate the quality of life and the well-being of the older seniors.
Keywords: Quality of life, subjective well-being, aged, exercise, physical activity.

Introduction

Aging is a constant, natural and inevitable process in living creatures' lives, characterized by biopsychosocial and cultural changes that are affected by intrinsic factors such as genetics and by extrinsic factors such as acquired experiences and the environment (World Health Organization [WHO], 2010). Therefore, the aging process can be categorized according to the functional aspects (Shephard, 2003), described as: a) old age: identified by the larger loss of function between 65 and 75 years old; b) advanced old age: between 75 and 85 years old, described as moderate aging when substantial changes are identified when performing daily tasks; and, finally, c) very advanced old age: this category includes seniors aged 85 years old and older who require special institutionalized and/or nursing care.

Taking into account the increase of life expectancy, researchers have been interested in studying the quality of life of the third age range, focusing on preserving and promoting the health and the well-being of this portion of the population so that they have a healthy aging (Fisken et al., 2015; Rachadel et al., 2015; Santin-Medeiros et al., 2017). According to the World Health Organization Quality of Life Group (WHOQOL, 1995), quality of life is the perception of individuals about their position in life combined with their sociocultural context and their objectives, expectancies, standards and concerns. Many authors evaluate the quality of life in seniors and they all agree that, as years pass by, the quality of life is affected due to the changes that occur during the aging process (Fisken et al., 2015; Rachadel et al., 2015; Santin-Medeiros et al., 2017). It believed that a better quality of life is closely associated with a subjective well-being that, according to Diener, Oishi and Lucas (2003), is related to one's evaluation of one's own experiences with positive affections of happiness, joy, and life satisfaction. As a result, a successful advance age follows from a quality of life and well-being that must be built upon and stimulated during all the other previous stages of development.

Preserving an active lifestyle is widely recognized as a beneficial factor during aging, and it promotes a better quality of life and a feeling of well-being, in different age groups, in multiple aspects. The physical and

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psychological benefits of an active lifestyle are well recognized (Camões et al., 2016). In other words, being physically active helps reduce psychosocial and health issues and is also an important prevention tool, especially for heart disease, diabetes and obesity. Furthermore, being physically active improves life expectancy and soothes and postpones debilitating conditions of aging.

Nevertheless, when analyzing the literature of the field, there is a prevalence of studies that restrict their sample to "seniors," whereas they actually investigate the aging process or limit themselves to the analysis of the quality of life and subjective well-being in general, that is to say, without taking into account the stages of aging (Haraldast et al., 2017; Rachadel et al., 2015; Sales et al., 2015). As a result, considering that regular physical activity has many benefits during senescence — among them, a better quality of life — and that these benefits impact on the way every person evaluates their lives in a positive way — subjective well-being, especially for elderly people — there are still gaps in the knowledge of this field. One of the gaps consists of the low scientific production for the population of older seniors, when compared to the production that includes younger seniors (between 65 and 75 years old). Therefore, there is the need to collect and identify studies that discuss this theme in order to increase understanding by investigating populations over 75 years old.

The objective of this study is to identify and analyze, through a systematic review, studies that evaluated the effects of physical exercises on the quality of life and on the subjective well-being of older seniors. An additional aim is to identify the measurement instruments used to evaluate the quality of life and subjective well-being in these studies. Finally, the findings of these studies are discussed, emphasizing the variables that are associated with these two constructs.

Material & methods

A systematic literature review was performed, following the PRISMA methodology (Moher et al., 2009), through an electronic search of studies as indexed articles on three databases (PubMed, Scopus, and the Virtual Health Library [Biblioteca Virtual em Saúde - BVS]). In order to encompass a significant amount of scientific production, it was chosen to combine the different terms indexed in the thesaurus Health Science Descriptors (Descritores de Ciências em Saúde - DeCS) and/or on the Medical Subject Headings (MeSH) of PubMed, such as "quality of life," "subjective well-being," "aged," "aged 80 and over," "exercise," and "physical activity". Only one search was performed on each database by using the following description: "quality of life OR subjective well-being AND aged OR aged 80 and over AND exercise OR physical activity".

Regarding the filters, it was chosen to restrict the section "article types" into "journal articles". For "publication dates", the year interval was between 2012 and 2017. One document per database was created from the searches performed, containing the titles and the abstracts of all the references that were found. The first stage of the exclusion criteria was the identification and deletion of duplicate articles. The other exclusion criteria were: (a) unavailable abstracts; (b) articles that did not seem encompass directly the subjects of study of this research; (c) non-use of instruments of psychometric measurement of quality of life or subjective well-being; (d) studies that did not encompass physical exercise; (e) samples including people who are disabled; (f) samples that only included institutionalized seniors; (g) articles that did not have seniors aged 75 and over; and (h) articles that were not considered covering controlled and randomized clinical trials. All these stages were performed by two researchers independently. Any possible divergence regarding the inclusion or the exclusion of articles was resolved by a third researcher.

All the articles were read in detail and their information was compiled and organized in the following way: 1) reference (year), 2) country of publication, 3) sample characteristics, 4) physical exercise or stipulated protocol of exercise, 5) measures of quality of life or subjective well-being, and 6) variables associated with quality of life or subjective well-being. Later on, the analysis and the interpretation of the results was performed, organizing them into three categories: (1) The relation of physical exercise on the quality of life and on the subjective well-being of older seniors; (2) the evaluative instruments for the quality of life and for the subjective well-being of older seniors; and (3) the variables associated with the quality of life and the subjective well-being of older seniors.

Results

In total, following the search methodology that was proposed 7,324 studies were found. Table 1 presents the number of articles that were identified on each database from the combination of keywords:

Table 1. Number of articles found in each database.

Search	Scopus	PubMed	BVS	Total
"*quality of life*" OR "*subject well-being*" AND "*aged" OR "aged, 80 and over" AND "exercise" OR "physical activity"*	3,543	3,395	386	7,324

Source: Table created by the authors. (2018)

Despite the high number of publications that were initially found, after the adoption of the exclusion criteria, only 22 articles satisfied all of them and were included in the analysis (Figure 1).

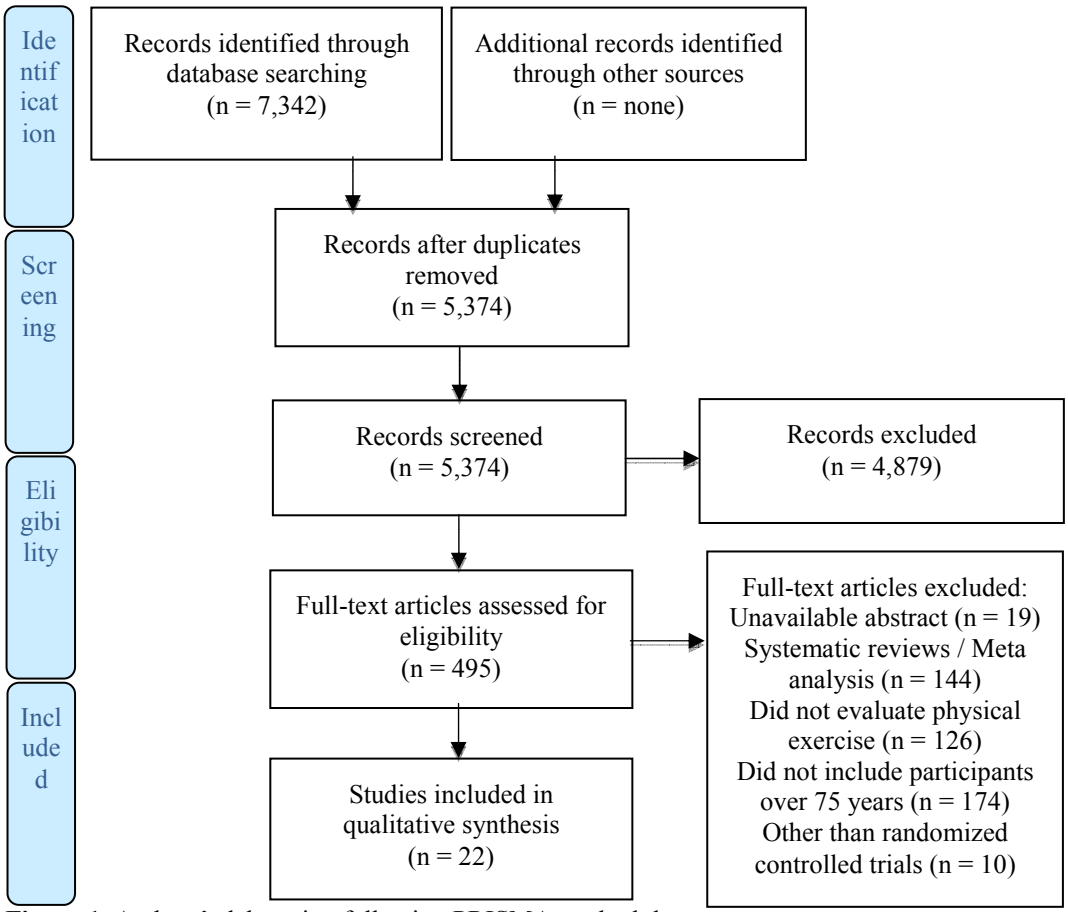

Figure 1. Authors' elaboration following PRISMA methodology.

Among the analyzed studies, there was a great diversity of physical exercises that are practiced by elderly people: yoga (Ni, Mooney, & Signoreli, 2016), tai chi chuan (Wayne et al., 2013), walking (Émile et al., 2014; Horder et al., 2013), whole-body vibration training (Santin-Medeiros et al., 2017), strength training (Haraldstad et al., 2017), resistance training (Solberg, et al., 2014), aerobic training (Brovold, Skelton, & Bergland, 2013), mixed/combined exercises (Gudlaugsson et al., 2012; Grubbs et al., 2016; Napoli et al., 2014; Sillanpää et al., 2014), exercise with animals (Grubbs et al., 2016), aqua exercise (Fisken et al., 2015; Oh et al., 2015), and home exercise (Brovold, Skelton, & Bergland, 2013; El-khoury et al., 2015), with emphasis on resistance training and mixed/combined exercises (Table 2).

Table 2. Description of the studies included in the systematic review.

Reference (year)	Country	Sample	Physical exercise or stipulated protocol of exercise	Measures of quality of life or subjective well-being	Associated variables
Gudlaugsson et al. (2012)	Iceland	♂ = 54 ♀ = 63 Range: 71-90 years	6 months Endurance (daily) and Strength training (twice a week)	Icelandic Quality of Life Questionnaire	Type of training Exercise duration
Sillanpää et al. (2012)	Finland	♂ = 108 ♀ = 96 Range: 39-77 years	21 weeks Strength training (twice a week) or Endurance (twice a week) Endurance and Strength training (four times a week)	RAND-36	Type of training VO_{2max}
Brovold et al. (2013)	United Kingdom	♂ = 70 ♀ = 45 Range: 70-92 years	3 months High-intensity aerobic exercise (three times a week) or Home exercise (three times a week)	SF-36	Exercise duration
Wanderley et al. (2013)	Portugal	♂ = 25 ♀ = 49 Range: over 60 years	8 months Resistance training (three times a week) or Aerobic training (three times a week)	SF-36	Exercise duration Functional capacity Type of exercise
Wayne et al. (2013)	United States of America	♂ + ♂ = 60 Range: 50-79 years	6 months Tai Chi Chuan (twice a week)	SF-36	Exercise duration
Napoli et al. (2014)	Italy	♂ = 40 ♀ = 67	52 weeks (three times a week) Flexibility and Aerobic training	IWQOL	Eating habits Exercise training

		Range: over 65 years	and Resistance training or Diet and Flexibility and Aerobic training and Resistance training		Weight loss
Solberg et al. (2014)	New Zealand	♂ = 32 ♀ = 67 Range: over 70 years	4 months (three times a week) Resistance training, Functional training, or Strength training	5-Item Satisfaction with Life Scale	Exercise Intrinsic motivation Resistance training
Émile et al. (2014)	France	♀ = 52 Range: 67-97 years	3 months Walking (twice a week)	WHOQOL- 26	Type of exercise Sex Type of measures
Fisken et al. (2015)	New Zealand	♂ = 2 ♀ = 33 Range: over 60 years	12 weeks Aqua Fitness Program (twice a week) or Hydrotherapy (once a week)	AIMS2-SF	Social interaction Aqua exercises Falls risk
El-Khoury et al. (2015)	France	♀ = 706 Range: 75-85 years	2 years *Ossébo* exercise/ Group training (once a week) (Proprioception, Strength training, Joint mobilization, Balance) and Home exercise (Balance - once a week)	SF-36	Sex Type of exercise/program Falls risk
Iliffe et al. (2015)	England	♂ = 472 ♀ = 782 Range: 65-94 years	24 months *Otago* strength training (three times a week) and Falls Management Exercise (Resistance training plus Balance) (three times a week) or Usual care	OPQOL EQ-5D SF-12	Physical activity level Falls risk
Trabal et al. (2015)	Spain	♂ = 8 ♀ = 16 Range: over 70 years	12 weeks Resistance training (three times a week) or Balance (once a week)	SF-36	Food supplementation Type of exercise
Mendoza-Ruvalcaba & Arias-Merino (2015)	Mexico	♂ = 7 ♀ = 57 Range: over 60 years	2 months (twice a week) "I am Active" (Strength training, balance and mobility)	Quality of Life Index	Type of exercise
Oh et al. (2015)	Korea	♀ + ♂ = 80 Range: over 65 years	10 weeks (3 times a week) Water exercises or Floor exercises	SF-36	Aqua exercise Falls risk
Sales et al. (2015)	Australia	♀ + ♂ = 120 Range: 60-90 years	18 weeks (twice a week) Mixed exercises (Strength training, balance, motor coordination and flexibility)	SF-12	Social interaction Type of exercise
Winters-Stone et al. (2015)	United States of America	♀ + ♂ = 32 couples Range: over 65 years	6 months (twice a week) Mixed exercises (Strength, balance, resistance and aerobic training)	SF-36	Exercise duration Exercises with the spouse Regularity
Dohrn et al. (2016)	Sweden	♂ = 2 ♀ = 92 Range: 66-86 years	7 days of exclusive or simultaneous use of pedometer and/or accelerometer	SF-36	Physical activity level Number of steps per day
Grubbs et al. (2016)	United States of America	♂ = 3 ♀ = 9 Range: over 65 years	6 weeks (three times a week) Exercises with dogs and Exercise (Strength training and balance) or Exercise (Strength training and balance)	WHOQOL-bref	Age Exercise with animals Exercise duration
Ni et al. (2016)	United States of America	♂ = 17 ♀ = 10 Range: 60-90 years	12 weeks Yoga (twice a week)	PDQ-39	Yoga Exercise duration Muscle strength
Santin-Medeiros et al. (2017)	Spain	♀ = 37 Range: 71-93 years	8 months Whole-body vibration training (twice a week)	SF-36	Exercise duration per week Exercise intensity and total duration
Haraldstad et al. (2017)	Norway	♂ = 49 Range: 60-81 years	12 weeks Strength training (three times a week)	SF-12	Muscle mass Muscle strength Exercise duration
Morisawa et al. (2017)	Japan	♂ = 12 ♀ = 35 Range: 65-82 years	6 months Health Japan 21 Program (daily)	MOS-36	Physical activity level

Note: ♂= men; ♀= women; AIMS2-SF = Arthritis Impact Measurement Scale 2-Short Form; EQ-5D = EuroQol Five-Dimensions Questionnaires; IWQOL = Impact of Weight on Quality of Life-Lite; MOS-36 = 36-Item Short-Form Health Survey (SF-36v2); OPQOL = Older People's Quality of Life Questionnaire; PDQ-39 =

Parkinson's Disease Questionnaire-39 item; RAND-36 = RAND 36-Item Health Survey ; SF-12 = Medical Outcomes Study Short Form 12-Item Health Survey; SF-36 = Medical Outcomes Study Short Form 12-Item Health Survey; WHOQOL-bref = World Health Organization Quality of Life-bref; WHOQOL-26 = World Health Organization Quality of Life.

Discussion

The aging process and the elderly population need attention from all health care professionals, since this population has increased considerably over the last few years. Due general improvement in living conditions, the population has been achieving greater longevity, which has also changed the demographic profile of the world's population. This fact enables studies about the practice of physical exercises. As a result, the importance of this literature review is emphasized because it aimed at analyzing the scientific output evaluating the effects of physical exercise on the quality of life and of older seniors' well-being. This population still receives little attention in scientific research.

Relation between physical exercise on the quality of life and on the subjective well-being of older seniors

Some of the benefits of the regular practice of physical exercises for elderly people are already recognized and accepted in the scientific community, not only physical benefits, but also psychological and social benefits (WHO, 2010).

For the male senior population, Haraldastd et al. (2017), through an intervention with resistance exercises for 12 weeks, verified that improvements in strength and muscle mass were related to the improvements in the functional capacity and physical autonomy of this group. This fact was confirmed by Winters-Stone et al. (2015), who, aside from analyzing these benefits, also verified that the strength training impacts positively on the social relations of seniors.

Another exercise that is commonly used for studies of the third age range is aerobic training. On the study of Wanderley et al. (2013), aside from the change in the body composition and decrease of body fat percentage, aerobic training was able to improve functional capacity and quality of life for seniors. Furthermore, a similar result was found for those that had practiced resistance training, except regarding mental health, which was more significant for those doing aerobic training (Wanderley et al., 2013). Brovold et al. (2013), when comparing the interval aerobic training to home exercises, verified that the benefits for functional capacity were more substantial on the aerobic group. However, both practices increased the level of physical activity and the quality of life for seniors.

There is considerable evidence for the benefits of strength training and resistance training. Studies of combined training demonstrate improvements in muscle resistance and the development of muscle strength, reduction of body mass index, and increase or possible maintenance of quality of life for seniors (Gudlaugsson et al., 2012). On the study of Sillanpää et al. (2012), the investigated subjects were separated into groups by exercise (strength, resistance, and combined) and it was verified that, despite an improvement of the quality of life of all three groups, there was a particular improvement of the vitality for the group with combined exercises. A higher vitality may mean the increase of the feeling of energy and mental agility, while on the other hand lower vitality can cause significant fatigue (Sillanpää et al., 2012).

Vitality was also evaluated in the study of Oh et al. (2015), as one of the subscales that had more progress during the intervention with water-based exercises. Other subscales of quality of life also presented expressive results (physical functioning, role-physical, role-emotional, bodily pain, vitality, and mental health) indicating an improved quality of life for the same group (Oh et al., 2015). The health transition subscale was considerably larger for the land-based exercises, proving that this type of physical exercise is also able to promote improvements in health conditions. Another finding is that in this study, both types of exercise produced an increase in falls efficacy, even though the water-based exercise group had obtained more significant results.

In order to reduce the risk factors of falling, and also aiming at a better well-being and health, Sales et al. (2015) proposed balance exercises together with strength training, motor coordination, flexibility, proprioception and aerobic exercises. In another study, yoga focusing on preventing falls has been used (Ni et al., 2016). The results of this study show improvements in physical capacities and other functions related to health that are also directly associated with Parkinson's disease (Ni et al., 2016). Twelve weeks of yoga twice a week was enough to promote the reduction of bradykinesia and joint stiffness and improved muscular strength, which also improves walking and reduces symptoms of disease. As a result, mobility and performance of daily activities improved.

It is possible to assume that physical exercise, when performed regularly, brings benefits to the older senior population. Many types of exercise seem to entail positive results in this population, especially combined exercises. These benefits are described on the biopsychosocial subscales (Table 2).

Evaluative instruments of the quality of life and of the subjective well-being of older seniors

Most of the studies found evaluated the quality of life by using multiple measurement instruments such as the following: Iceland Quality of Life Questionnaire, Impact of Weight on Quality of Life-Lite (IWQOL),

Arthritis Impact Measurement Scale-Short Form (AIMS2-SF), Older People's Quality of Life Questionnaire (OPQOL), Quality of Life Index, World Health Organization Quality of Life (WHOQOL-26), World Health Organization Quality of Life-bref (WHOQOL-bref), EuroQol Five-Dimensions Questionnaires (EQ-5D), and Parkinson's Disease Questionnaire-39 Items (PDQ-39). Only two studies evaluated subjective well-being, of which only one used an evaluative instrument (Solberg et al., 2014), the 5-Item Satisfaction with Life Scale.

The measurement instrument that was used the most in order to evaluate quality of life was the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), with half of the studies using it to evaluate their construct. The SF-36 is a multidimensional questionnaire composed of 36 items, with two to six possibilities of objective answers, distributed into eight subscales that can be grouped together into two larger groups: physical (functional capacity, physical aspects, pain, and general health condition) and mental (mental health, vitality, social traits, and emotional traits). Iliffe et al. (2015), Sales et al. (2015), and Haraldstad et al. (2017) used the short version of the SF-36, the Medical Outcomes Study Short Form 12-Item Health Survey (SF-12), which reinforces the focus on this instrument, either on its full or short form.

Some studies used specific questionnaires to determine the diseases related to older seniors. Among them were Ni et al. (2016), which worked with those with Parkinson's disease (PDQ-39); Fisken et al. (2015), which investigated the elderly population with rheumatoid arthritis (AIMS2-SF); and Napoli et al. (2014), which investigated obese elderly people (IWQOL).

In most of the evaluated studies, it was verified that the authors used only one instrument to evaluate the quality of life or subjective well-being. However, Iliffe et al. (2015) adopted three different instruments (OPQOL, EQ-5D, and SF-12) to investigate 1,254 European elderly people, aged between 65 and 94 years old, from different cities, in order to evaluate two exercise programs that promote physical exercise. Nevertheless, the authors did not justify why they choose those instruments. It is believed that the reason is the lack of gold-standard instruments. As a result, the three instruments aimed to complement the evaluation of quality of life for a wide and heterogeneous population.

Regarding subjective well-being, Sales et al. (2015) based themselves in the improvement of the quality of life and in other benefits deriving from exercise, such as an improvement in the level of physical activity, functional capacity, and social interaction, in order to infer the subjective well-being construct. On the other hand, Solberg et al. (2014) used the 5-Item Satisfaction with Life Scale, a specific instrument to measure this construct.

It is possible to see a great variety of instruments to measure the quality of life in seniors, particularly the application of the SF-36 and its short form (SF-12). However, choosing to employ this instrument may depend on the population being studied and its sociodemographic characteristics. Some authors choose specific questionnaires for diseases such as parkinsonism (PDQ-39), rheumatoid arthritis (AIMS2-SF), and obesity (IWQOL), and/or taking into account geographical areas (Iceland - Iceland Quality of Life Questionnaire, Europe - EuroQol Five-Dimensions Questionnaires [EQ-5D]). When it comes to subjective well-being, the lack of studies does not permit any type of evaluation.

Variables associated with the quality of life and with the subjective well-being of older seniors

Sex

Most of the analyzed studies used mixed samples of men and women. None of them compared the quality of life or subjective well-being between the two sexes. Due to genetic and sociocultural factors, it is possible to affirm that men and women have biological, psychological and social differences that can affect and interfere directly in perception and in the management of quality of life and/or subjective well-being. The lack of data makes it difficult to come to conclusions regarding the differences between both sexes on the quality of life and the subjective well-being of older seniors. However, the results concerning the improvements in quality of life and on subjective well-being indicate that both sexes benefit from the regular practice of physical exercises. Studies that directly compare these two variables are suggested.

Age

Seniors aged 75 and older were the focus of this review. Nevertheless, some of the studies analyzed elderly people aged over 65 years old and also younger populations, like Sillanpää et al. (2012) and Wayne et al. (2013). Such studies did not separate the analysis of quality of life or subjective well-being according to age groups, which compromises the interpretation of these constructs for the intended population of this study (older seniors). Among the analyzed studies, only the research carried out by El-Khoury et al. (2015) investigates exclusively the age group of interest of this review. Another four studies presented similar samples. In other words, they include subjects aged over 75 years old: Brovold et al. (2013), Gudlaugsson et al. (2012), Santin-Medeiros et al. (2017), and Solberg et al. (2014).

For advanced old ages, benefits of the regular practice of physical exercises can be seen in the improvement of physical fitness, strength-training performance, and reduction of body mass index (Gudlaugsson et al., 2012). Regular practice also benefits social relations and the functional capacity of the long-lived (El-Khoury et al., 2015), including those who spend a period of time in hospital (Brovold et al., 2013).

It is important that the exercises are planned and structured, taking into account the limitations, needs, and concerns of this population. In other words, exercises lacking consistent information regarding ideal

protocols, frequency, and duration of training may not bring benefits (Santin-Medeiros et al., 2016). On the other hand, higher levels of motivation are associated with satisfaction with life, increase of vitality and positive feelings, and decrease of negative feelings. To sum up, both quality of life (Brovold et al., 2013; El-Khoury et al.; 2015; Gudlaugsson et al., 2012) and subjective well-being (Solberg et al., 2014) can be improved with a regular practice of physical exercises.

Furthermore, despite the great number of studies that include seniors, it is still necessary to carry out more accurate research that respect the aging limits of the sample so that precise information about the quality of life and the subjective well-being of older seniors be reproduced. Further studies should compare the stages of aging, such as advanced old age and very advanced old age.

Falls

With advanced age the risk of falls increases. Falls and the fear of falling can be identified as risk factors that reduce daily physical activities, satisfaction with life, and self-efficacy, interfering in the perception of quality of life in the elderly population (El-Khoury et al., 2015; Fisken et al., 2015; Oh et al., 2015). In other words, when associated with the risk of falls, aging can be related to lack of balance, low muscle strength, and a slower gait speed, which causes the limitation or the interruption of tasks and consequently jeopardizes the independence of the seniors.

Exercising was also demonstrated to be efficient in preventing and controlling falls in healthy seniors or even those who have certain diseases, due to the improvement in balance (Iliffe et al., 2015), improvement in walking ability (El-Khoury et al., 2015), improvement in muscle strength and flexibility (Oh et al., 2015), and even the benefits of self-efficacy, self-esteem and reduced fear of falling.

Preventing or minimizing problems deriving from falls contributes to the maintenance or increase of functionality and quality of life, especially the physical, symptomatic, and social attributes of seniors with rheumatoid arthritis (Fisken et al., 2015); physical function, vitality, and general health of women between 75 and 85 years old in a balance program (El-Khoury et al.,2015); and physical and emotional attributes, pain, vitality, and mental health of seniors with records of falling when performing water-based exercises (Oh et al., 2015). The scientific field that investigates physical exercise and its benefits of preventing or reducing the risk of falls on seniors is very wide. However, based on the studies that were found, there is a lack of studies that investigate falling related to multiple levels of physical activity by exploring and comparing the sexes and the different stages of aging.

Other variables

From the topics above, a few variables were associated with the quality of life and/or subjective well-being. Other variables were also found to be less frequent during this review, although not less significant. All of them, in some way, interfere with or affect the development or perception of quality of life and subjective well-being of older seniors. Among them, it is possible to mention: VO_2max (Sillanpää et al., 2012), functional capacity (Wanderley et al., 2013), self-motivation (Solberg et al., 2014), restricted feeding practices (diets) and reduction of body weight (Napoli et al., 2014), social interaction (Fisken et al., 2015; Sales et al., 2015), food supplementation and type of questionnaire (Trabal et al., 2015), place of exercises (Sales et al., 2015), frequency (Santin-Medeiros et al., 2017), intensity (Santin-Medeiros et al., 2017), muscle strength (Haraldstad et al., 2017; Ni et al., 2016), and muscle mass (Haraldstad et al., 2017). Such variables should be studied in further research with older seniors, in order to expand the results identified so far.

Conclusions

The results of this systematic review lead to the conclusion that the physical exercise is extremely important, not only for healthy seniors, but also for those who have specific diseases, such as parkinsonism, cancer, osteoporosis, rheumatoid arthritis, obesity, depression, etc. The benefits can be seen, not only in physical fitness, but also in functional capacity, resulting in greater physical autonomy and independence. Furthermore, it includes improvements in cognition, self-efficacy, and satisfaction, resulting in positive feelings towards life. However, as the aging process is complex and multidimensional and does not occur equally for every individual, it is necessary that further studies evaluate the quality of life and subjective well-being by taking into account the age of the elderly population, instead of taking it generally. In other words, it is necessary to evaluate the seniors according to their stage in the aging process in order to obtain more accurate and clear results about the benefits of the physical exercise and feelings toward life.

This analysis indicates that there is no one ideal instrument to evaluate the quality of life. Nevertheless, it was verified that researchers have a preference for the SF-36, as well as its short form, the SF-12. Furthermore, it was verified that more studies that relate subjective well-being to the practice of exercise in the elderly population are needed. Finally, some of the investigated variables were shown to affect the quality of life and/or the subjective well-being of older seniors, such as sex, age, and record of falls.

Conflicts of interest – Authors declare no conflicts of interests.

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