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REVIEW ARTICLE

Effects of combined exercise program on happiness and life satisfaction on physically active older adults

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Abstract

Well-being is the assessment of individual experiences with pleasant feelings like happiness and life satisfaction. Combined training is recommended for older adults to decrease age-related psychological changes and functional limitations. This systematic review aimed to assess the effects of a combined exercise program on happiness and life satisfaction in physically active older adults. The electronic databases of Google Scholar, Web of Science, and PubMed were searched between 2000 and 2023 for available literature. The searched keywords were: older adults, training, exercises, happiness, and life satisfaction. After completing the investigation, 931 publications were found. Inclusion criteria comprised physically active participants aged 60 years and above, along with studies composed in English. Studies in which participants had obesity, diabetes, and other non-communicable diseases were excluded from investigation. The qualitative analysis involved eight studies. These studies ranged in publication date from 2008 to 2022. The participants in the studies were men and women aged from 60 to 79 years. The sample size was 1849 and ranged from 35 to 656 participants. Physical activity was a combination of aerobic training, strength training, stretching exercises, and balance exercises. The most used questionnaire was the Satisfaction with Life Scale (SWLS). The findings indicate that older adults of both genders who underwent combined training programs had higher levels of happiness and life satisfaction. Research has shown that leading an active lifestyle enhances older persons' happiness and satisfaction with life. These results support the importance of maintaining an active lifestyle to improve the mental and emotional well-being of older adults.

Keywords: older adults · training · exercises · happiness · life satisfaction

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Introduction

According to WHO (2010), aging is a continuous, natural, and unavoidable process that affects every living organism. It has been proved that older people are not as physically active in comparison with other people which could be important if it has an impact on one's health given the growing number of older adults (Milanović et al., 2012). The categories that follow the aging process can be made based on functional aspects: a) old age: defined as a greater decline of function between the ages of 65 and 75; b) advanced old age: defined as moderate aging between the ages of 75 and 85 when notable changes in the ability to perform physical activities (PA) of daily living start to appear; and, lastly, c) very advanced old age: this category includes people 85 years of age and older who need special medical care or institutionalization (Shephard, 2003). To minimize the functional limitations and psychological changes that come with getting older, strength training, cardiovascular exercise, and flexibility exercises are advised for older adults. Researchers have focused more on the physiological benefits of exercise than the psychological ones (Cronin, 2001). Researchers are interested in investigating the quality of life of older adults, with an emphasis on maintaining and improving this population's health and well-being while helping them to age in a healthy way, in light of the rising average longevity (Fisken et al., 2015; Rachadel et al., 2015; Santin-Medeiros et al., 2017). Numerous authors evaluate older adults' quality of life, and they are all in agreement that changes brought about by aging cause quality of life to fluctuate with time (Fisken et al., 2015; Rachadel et al., 2015; Santin-Medeiros et al., 2017). Subjective well-being, which is defined as the evaluation of one's personal experiences with positive emotions like happiness (HAP) and life satisfaction (LS), is thought to be strongly associated with a greater quality of life. Therefore, the development of a quality of life and well-being that should be developed and supported during all earlier phases of development provides a solid basis for independent functioning in old age (Diener et al., 2003). The idea of well-being has become increasingly significant as a measure for assessing life quality. According to Kammann & Flett (1983), the availability of social and medical services, one's financial status, or a state of health have minimal bearing on one's level of LS and HAP. Consequently, it is important to consider how PA might serve as a mediator for improving HAP levels in older adults by improving their health. The two aspects that make up subjective well-being are affective and cognitive (Diener et al., 1999; Pavot & Diener, 2009). The cognitive component pertains to LS and indicates an assessment procedure whereby individuals evaluate their lives according to subjective standards (Shin & Johnson, 1978; Veenhoven, 2011). The affective component is related to HAP and is the emotional assessment of the volume and quality of good experiences and moments of HAP in a person's life (Magen, 1996; Veenhoven,

2011). This systematic review aimed to explore the effects of combined exercise program on happiness and life satisfaction on physically active older adults.

Method

This review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement guidelines (Page et al., 2021).

Literature searching strategy

This article is a systematic review of existing studies, which involves researching the effects of a combined exercise program on happiness and life satisfaction in physically active older adults. The electronic databases of Google Scholar, Web of Science, and PubMed were searched for all available literature between 2000 and 2023. The searched keywords were: older adults, training, exercises, happiness, and life satisfaction. After searching databases and bibliographic search results for relevant research, article titles and abstracts were screened to find any potentially relevant publications and underwent a full-text review, with final approval needed if the publications met inclusion criteria. The search strategy was separately performed by two authors (R.H. and A.I.), and only papers written in English were chosen for the analysis. Disagreements were settled through discussions between the two writers.

Eligibility criteria

The selected studies focus on the effects of combined exercise program on happiness and life satisfaction on physically active older adults. Criteria for inclusion in further analysis were that the samples included physically active male and female participants over 60 years old. The selected studies are written in English, peer-reviewed, and published in scientific journals. Review articles, systematic reviews, meta-analyses, master's and doctoral theses, and abstracts from scientific congresses were not considered. Studies in which participants had obesity, diabetes, and other non-communicable diseases were excluded from investigation.

Table 1. Characteristics of the studies included in the review

Reference	Sample (n, Gender, Age)	Physical activity	Program duration	Questionnaire	Outcomes
Syue et al. (2022)	n=623 (m, f) 73,71 ± 5,91 years	HPA, MPA, LPA	22 months	SILSS	HPA – LS ↑ MPA – LS ↑
Kaučič et al. (2022)	n=656 (m, f) < 65 years (78.2)	BE	transversal	SWLS OWA	BE – LS ↑
Gülhan et al. (2021)	n=35 (f) 65-74 years	WAL, ST, STR, BE, CPH	14 weeks	OHQ-SF	WAL, ST, STR, BE – HAP ↑ CPH – HAP ↑
Mohammadi Mehr et al. (2019)	n=96 (m, f) 60-70 years	HLE, PA	2 months	LSI-Z OHI	PA and HLE – HAP ↑ PA and HLE – LS ↑
Khazaee-Pool et al. (2015)	n=120 (m, f) (71,0 ± 5,86 years)	PEP	8 weeks	OHI	PEP – HAP ↑
Solberg et al. (2014)	n=62 (m, f) 75 years	ET (Nordic walking, aerobics, and hiking), CST	4 months	SWLS	ET – HAP ↑
Mudrák et al. (2011)	n=212 (m, f) <60 years	HLE; HPA, MPA	transversal	LTEQ PASE SWLS	HPA, MPA – LS ↑
Katula et al. (2008)	n=45 (m, f) (74,8 years)	PT, ST (resistance & strength)	12 weeks	SWLS	PT, ST - LS ↑

LEGEND: ↓-increase/improvement; ↓-decrease/decline; ↔-no significant changes; +-feasible, useful, effective; HPA-High intensity physical activities; MPA-Moderate intensity physical activities; LPA- Low intensity physical activities; SILSS-Single-item life satisfaction scale; BE-Balance exercises; SWLS- Satisfaction with life scale; OWA-Oldwellactive; WAL-Walking; ST- Strength training; STR-Stretching; CPH- Combined pharmacotherapy; OHQ-SF-Oxford Happiness Questionnaire-Short Form; HAP-Happiness; HLE-Healthy lifestyle education; PA-Physical activity; LSI-Z- Life Satisfaction Index-Z; OHI-Oxford Happiness Inventory; PEP- Physical exercise programme; ET-Endurance training; CST-Circuit strength training; LTEQ-Leisure Time Exercise Questionnaire; PASE-Physical Activity Survey for the Elderly; PT-Power training.

Data Collection

After completing the investigation, 931 publications were found. Only eight research were found suitable for assessment; the remaining studies (inadequate sample, inadequate methodologies, abstracts, lack of comprehensive study procedure results, etc.) were not taken into consideration. These studies ranged in publication date from 2008 to 2022. The procedure for gathering, examining, and removing the examined works is shown in Figure 1. The experimental studies that met the specified criteria were then analyzed and presented in Table 1.

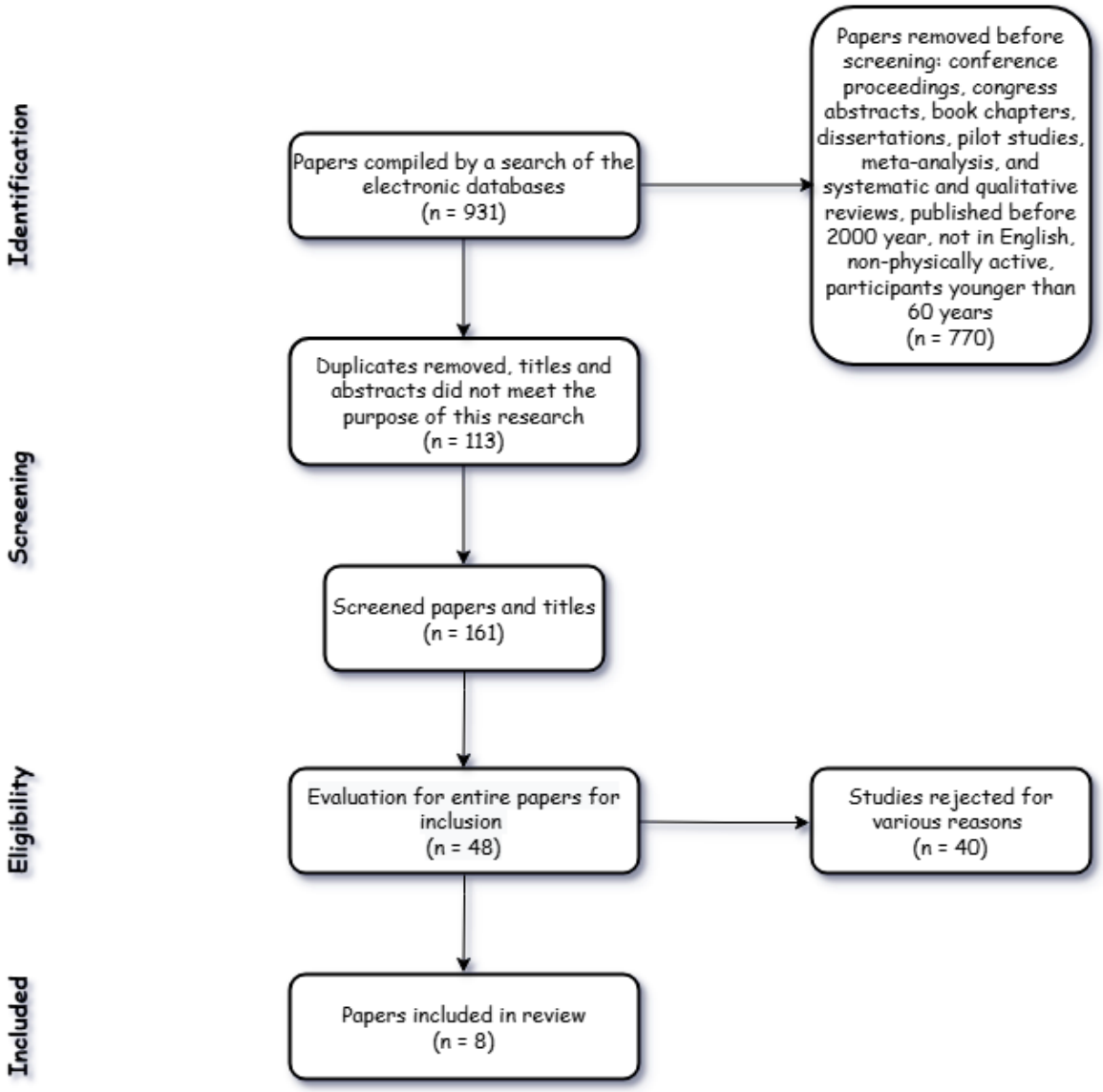

Figure 1. PRISMA study flow diagram

Results

Description of the studies reviewed

Table 1. displays the articles that met the requirements. Each research study's summary contains the information listed below: the reference (authors and year), a sample of participants (number of participants, gender, and age), physical activity, program duration, questionnaire, and outcomes, shown by an adequate symbol.

The participants in the studies were men and women aged from 60 to 79 years. The sample size was 1849 and ranged from 35 to 656 participants. From the total of 8 studies, only one was conducted on women (Gülhan Güner et al., 2021). Mixed samples of participants were in 7 studies (Katula et al., 2008; Kaučič et al., 2022; Khazaee-Pool et al., 2015; Mohammadi Mehr et al., 2019; Mudrák et al., 2011 Solberg, et al., 2014; Syue, et al., 2022). PA was a combination of aerobic training (AT), strength training (ST), stretching exercises (STR), and

balance exercises (BE), combined with healthy lifestyle educations (HLE) and combined pharmacotherapy (CPH). The most frequently monitored PA in the selected studies included different kinds of AT: high intensity physical activities (HPA) (Mudrák et al., 2011; Syue et al., 2022), moderate intensity physical activities (MPA) (Mudrák et al., 2011; Syue et al., 2022), low intensity physical activities (LPA) (Syue et al., 2022), walking (WAL) (Gülhan et al., 2021), PA (Mohammadi Mehr et al., 2019), and endurance training (ET) (Solberg et al., 2014). The scientific research provides evidence for the significance of ST: ST (Gülhan et al., 2021), physical exercise programme (PEP) (Khazaee-Pool et al., 2015), circuit strength training (CST) (Solberg et al., 2014), power training (PT) & ST (Mudrák et al., 2011). A smaller number of studies have been conducted on BE (Gülhan et al., 2021; Kaučič et al., 2022). STR were performed in one research (Gülhan et al., 2021). Programs HLE was used in two studies (Mohammadi Mehr et al., 2019; Mudrák et al., 2011). CPH was utilized during the exercise program only in one research (Gülhan et al., 2021). The most used questionnaire was the Satisfaction with Life Scale (SWLS): (Kaučič et al., 2022; Katula et al., 2008; Mudrák et al., 2011; Solberg et al., 2014). Oxford Happiness Inventory (OHI) was utilized in two studies (Khazaee-Pool et al., 2015; Mohammadi Mehr et al., 2019). Single-item life satisfaction scale (SILSS) and Oldwellactive (OWA) were used by Syue et al. (2022). Oxford Happiness Questionnaire-Short Form (OHQ-SF) was used by Gülhan et al. (2021). Life Satisfaction Index-Z (LSI-Z) was utilized by Mohammadi Mehr et al. (2019). Leisure Time Exercise Questionnaire (LTEQ) and Physical Activity Survey for the Elderly (PASE) were applied in study by Katula et al. (2008).

Discussion

It has been scientifically proven that leading an active lifestyle beyond old age can be advantageous for overall well-being and quality of life in all age groups and domains. It is often known that leading an active lifestyle has both psychological and physical benefits. Participating in PA also increases life expectancy and slows down the aging process, which can damage biological functioning (Camões et al., 2016). Exercise recommendations for older adults usually focus on training programs that most commonly consist of a combination of ET, ST, BE, and SE because ET and ST alone do not improve overall wellbeing. Exercise's influence on health and PA in older adults has been the goal of several studies, and the data supporting combined exercise programs for this population is significant (Arent et al., 2000; Müller-Riemenschneider et al., 2008; Netz et al., 2005). Nonetheless, beneficial effects have been shown with other types of training, such as yoga (Oken et al., 2006), PT and ST (Henwood et al., 2008; Katula et al., 2008), and functional training (Whitehurst et al., 2005). The positive correlation was found between PA and HAP (Zhang & Chen, 2019) as well as PA and LS (Maher et al., 2015). Leitner & Leitner (2004) found that PA and personal LS correlate positively. The duration and kind of exercise may affect LS. According to Mudrák et al. (2015), participants who met the required level of PA (moderate to vigorous exercise) were more satisfied with their lives. An exercise program (WAL, SE and ST) enhanced HAP and LS, according to a randomized controlled study of exercise on older adults (McAuley et al., 2000). WAL and other recreational PA were found to be related to HAP in another study conducted on older people (Onishi et al., 2006). The findings of the research mentioned above agree with the results of this systematic review. Results from a vast number of selected research have demonstrated the beneficial effects of AT (HPA, MPA, WAL, PA, ET) on LS. According to Syue et al. (2022) and Mudrák et al. (2011), older persons during MPA and HPA reported higher levels of LS than those with LPA. The authors (Gulhan et al., 2021; Solberg et al., 2014), discovered that WAL and ET have a positive effect on HAP. Adopting a healthy lifestyle education (HLE) and participation in PA can enhance LS and HAP among elderly people (Mohammadi Mehr et al., 2019). There is a number of studies on older adults that involve AT and ST (Arent et al., 2000; Netz et al., 2005). The findings of the only research (Gulhan et al., 2021) conducted on elderly women, indicate that the medication management (CPH) and exercise regimen (WAL, ST, STR, and BE) used during home visits significantly raised the HAP levels of older female participants. Different kinds of ST have been shown to improve older adults' HAP. According to Khazaee-Pool et al. (2015), PEP increases older participants' HAP such as CST (Solberg et al., 2014). According to the findings of Katula et al. (2008), PT and ST have a positive impact on LS levels in older adults. Research (Kaučič et al., 2022) indicates that BE is more common among older people living in institutions and has a positive effect on LS. It's important to live in a community because the level of LS decreases when loneliness is taken into account (Jovančević & Milićević, 2021). Numerous social and psychological changes related to aging may lower older adults' level of HAP by increasing their risk of disease and impairment. In older adults, HAP has a major role in mental health, and its

improvement is significant (Angner et al., 2009). While most of studies found an inverse relationship between age and LS, with lower LS during early and older adulthood and higher LS during young and middle adulthood, Diener et al. (1999) found that LS remains stable across different life stages. Maher et al. (2015) also revealed that participants who exercised more had higher levels of LS, discovering a greater benefit from PA than younger adults. Prior studies (Kye & Park, 2014; Piqueras, Kuhne, Vera-Villarroel, Van Straten & Cuijpers, 2011), evaluating the connection between HAP in the general population and PA levels, have demonstrated a positive correlation between them. Consequently, it was concluded that PA enhances HAP on older individuals' and can result in even greater gains in their mental health and general well-being, when combined with other psychosocial treatments. Similar discrepancies exist between HAP and age; for instance, older persons report lower levels of HAP (Swift et al., 2014) and it declines with age (Portela et al., 2013; Rözer & Kraaykamp, 2013). It is uncertain how varied PA affect HAP and LS. They are strongly correlated with demographic traits. Higher levels of education (Orviska et al., 2014; Rözer & Kraaykamp, 2013), higher income levels (Rözer & Kraaykamp, 2013; Swift et al., 2014), married status (Helliwell & Putnam, 2004; Portela et al., 2013; Rodríguez-Pose & Von Berlepsch, 2014; Swift at al., 2014), and female gender are generally associated with greater subjective LS or HAP. In older adults, PA and LS have been proved to be positively correlated (Teixeira Vaz et al., 2019). Regarding trends in HAP and LS over the lifespan, the results are not always constant.

Conclusions

The purpose of this systematic review was to analyze the included studies to ascertain whether or not an exercise regimen consisting of combined exercise programs may improve the HAP and LS status of physically active older adults from different genders and ages. The HPA, MPA, LPA, WAL, PA, ET, ST, PEP, CST, PT, BE, and STR were the were the training regimes that were examined. Data were gathered based on measurements made with different questionnaires for LS and HAP: SILSS, SWLS, OWA, PHQ-SF, LSI-Z, OHI, LTEQ, and PASE. According to the results of all 8 studies included in this systematic review, it can be concluded that combined training programs enhances HAP and LS adults of both genders. These results support the importance of maintaining an active lifestyle to improve the mental and emotional well-being of older adults. The results of this study demonstrated that older adults' LS and HAP levels were strongly impacted by the association between increasing age and physical activity or exercise. The findings were not significantly different according to various study designs, types of interventions, sample sizes, or demographic factors. A small number of studies have been carried out to examine the relationship between happiness and physical activity among older adults and despite the aforementioned limitation, our study has shown positive effects of PA on HAP and LS. Improving the well-being and quality of life of a wide range of older people would be quite cost-effective, especially in light of the impacts of PA and the growing costs of the healthcare system. With an increasing number of older persons, it will be necessary to use approaches that work to increase physical activity among this population. Since there are numerous barriers to exercise for older persons, developing cost-effective programs that help participants start and continue regular physical activity over an extended period is still a significant priority.

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