Review article

Multicomponent training on mental health and quality of life in older people: a systematic review

Entrenamiento multicomponente sobre la salud mental y calidad de vida en personas mayores: una revisión sistemática

Treinamento multicomponente sobre saúde mental e qualidade de vida em pessoas idosas: uma revisão sistemática

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Sepúlveda-Mancilla, C., Martínez-Lema, D., Lopéz-Pinilla, J. P., Muñoz-Albarrán, P., Castro-Pérez, J., & Sanhueza-Arratia, C. (2024). Entrenamiento multicomponente sobre la salud mental y calidad de vida en personas mayores. Una revisión sistemática. *Revista Ciencias de la Actividad Física UCM, 25*(2), julio-diciembre, 1-20. https://doi.org/10.29035/rcaf.25.2.2

ABSTRACT

The present study aims to describe the main effects of different multicomponent training protocols on variables associated with mental health and perception of quality of life in the elderly. Methodologically, it is carried out by means of a systematic review oriented to the guidelines of the PRISMA declaration. The evidence available in the PUBMED and ScienceDirect databases was consulted, and 10 articles were selected based on the screening and eligibility criteria. From these, findings related to the improvement of quality of life and mental health in the elderly were compiled. However, an extrapolation of results cannot be established due to the scarce consideration and standardization of the evaluations of the variables mentioned. Therefore, we conclude that it is necessary to consider mental health and quality of life variables as primary variables to evaluate the effects of multicomponent training in the elderly.

Key words: Multicomponent exercise; Elderly; Mental health; Health-Related Quality of Life

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RESUMEN

El presente estudio tiene como objetivo describir los principales efectos de diversos protocolos de entrenamiento multicomponente sobre variables asociadas a salud mental y percepción de la calidad de vida en personas mayores. Metodológicamente se ejecuta mediante una revisión sistemática orientada a los lineamientos de la declaración PRISMA. Se consultó la evidencia disponible en las bases de datos de PUBMED y ScienceDirect, a partir del tamizaje y criterios de elegibilidad se seleccionaron 10 artículos, a partir de los cuales se compilan hallazgos vinculados a la mejora de la calidad de vida y salud mental en personas mayores, aunque no se puede establecer una extrapolación de resultados debido a la escasa consideración y estandarización de las evaluaciones de las variables mencionadas. A partir de lo anterior, se concluye que es necesario considerar variables de salud mental y calidad de vida como variables primarias para evaluar los efectos del entrenamiento multicomponente en personas mayores.

Palabras clave: Entrenamiento multicomponente; Persona mayor; Salud mental; Calidad de vida relacionada con la salud.

RESUMO

O objetivo deste estudo é descrever os principais efeitos de diversos protocolos de treinamento multicomponentes sobre variáveis associadas à saúde mental e à percepção de qualidade de vida em idosos. Metodologicamente, é realizado através de uma revisão sistemática orientada às diretrizes da declaração PRISMA. Foram consultadas as evidências disponíveis nas bases de dados PUBMED e ScienceDirect, com base nos critérios de triagem e elegibilidade, foram selecionados 10 artigos. A partir do qual são compilados resultados ligados à melhoria da qualidade de vida e da saúde mental dos idosos, embora não seja possível estabelecer uma extrapolação dos resultados devido à limitada consideração e padronização das avaliações das variáveis acima mencionadas. Do exposto, conclui-se que é necessário considerar as variáveis de saúde mental e qualidade de vida como variáveis primárias para avaliar os efeitos do treinamento multicomponente em idosos.

Palavras chave: Treinamento multicomponente; Pessoa maior; Saúde mental; Qualidade de vida relacionada à saúde.

INTRODUCTION

Aging is a normal process, associated with physiological changes such as decreased muscle mass and increased fat mass, among others, which implies a reduction in the functional capacity of older people (OP) (Fragala et al., 2014, 2019). In addition, the physiological changes associated with high levels of sedentary lifestyle in older people can favor the appearance of various physical and mental health disorders (Astorga et al., 2021), negatively affecting their quality of life (Papa et al., 2017).

In Latin America, there is a change in the population pyramid, which means that countries will increasingly have more older adults (Moyano, 2016), so the aforementioned population aging may mean an increase in the cost of public health due to an increase in the demand for services by this population (Avaca & Retamal, 2015); It is important to consider that, in addition to physical health problems, it is necessary to evaluate and preview alterations linked to mental health, cognitive alterations and quality of life (Poblete-Valderrama et al., 2015).

Physical exercise is key to maintaining the functionality of the MP due to its multiple physical and psychological benefits (Cigarroa et al., 2022). From the physical dimension, a positive effect has been reported on sarcopenia (Fernandez-Ortega & Hoyos-Cuartas, 2020), functional physical condition (Aguilar et al., 2021) and the risk of falls (Chalapud & Molano, 2023). Furthermore, physical activity is a protective factor for the development of chronic non-communicable diseases (NCDs) (Gonçalves et al., 2017) by increasing IGF-1, a metabolic indicator that favors cellular repair processes and reduces the physiological deterioration associated with aging (Galaviz et al., 2021). On the other hand, from the psychological dimension it has been reported that exercise improves mood (Villarreal et al., 2016) and that, for example, women who practice Tai-Chi have better cognitive performance, greater satisfaction in daily activities and lower levels of depression and anxiety compared to sedentary women (Orozco et al., 2016). In addition, physical activity improves the perception of quality of life in OP with multimorbidity (Santos-Luna et al., 2022) positively impacting social, psychological and physical health (Villarreal-Angeles et al., 2020).

Various training modalities have been proposed in OP. For example, strength training shows positive results on muscle strength and function (Daniels et al., 2008), body composition, oxygen consumption and agility/balance (Miranda-Aguilar et al., 2020), and balance training is shown to be effective on postural control and the risk of falls (Chalapud & Molano, 2023). On the other hand, moderate-intensity aerobic training favors effort tolerance, although no differences are found between this modality and strength training on the level of dependence (Izquierdo, 2019). On the other hand, training linked to sports practice demands more than one physical capacity (for example, strength, cardiorespiratory endurance, flexibility, balance and coordination), evidencing its positive effects on the physical, psychological and cognitive health of OP (Linhares et al., 2022). Thus, multicomponent training (MCT) is proposed as an interesting alternative that has also shown favorable results on physical and cognitive performance (Cadore et al., 2013).

MCT is characterized by including several exercise modalities (e.g., aerobic, strength, flexibility, balance, and coordination) (Yi et al., 2023) and has been shown to be effective in reducing frailty and dependency in OP (Rodriguez-Larrad et al., 2017). In general, the total time of an MCT session is approximately 60 minutes (30 minutes of strength, 15 minutes of balance, and 15 minutes of flexibility),

administered for three months and three sessions per week (Villareal et al., 2011); however, the heterogeneity in its implementation criteria makes it difficult to establish a definitive protocol (Viladrosa et al., 2017).

Most evidence about the effects of MCT is related to physical performance; fewer aspects of mental health and quality of life have been studied. In this regard, Cárcamo-Regla et al. (2021), in a review that included 21 studies, describe various MCT protocols and the most frequent outcome variables. All studies reported the measurement of at least three physical capacity indicators. However, the measurement of the psychological dimension was less consistent and only six studies considered three or more mental health indicators.

Recent reviews have analyzed the effects of general physical exercise without specifying MCT (Da Silva et al., 2022; Labata-Lezaun et al., 2023; Mahmoudi et al., 2022). Mahmoudi et al. (2022), point out that exercise reduces depressive symptoms and improves the perception of quality of life in OP; however, they recommend the need to specify the modality and dose of training to delve deeper into the results. Da Silva et al. (2022), consider the effects of physical exercise, including MCT and linking it to dual-task interventions, so it is not possible to determine the isolated effects of MCT; However, the authors highlight the benefits of exercise in improving well-being. On the other hand, Labata-Lezaun et al. (2023) focus specifically on the effects of MCT on physical performance (strength, aerobic capacity and gait speed) and the prevention of age-related disorders, recommending this training modality as a strategy to improve physical health in OP.

Although several reviews have directly or indirectly addressed the effects of MCT, especially on physical variables, to the best of the authors' knowledge, a review has not been conducted that exclusively analyses the effects of MCT on mental health and quality of life in the older population. Therefore, the purpose of the present study was to synthesize the current evidence on the effects of MCT administered as a sole intervention on mental health and the perception of quality of life in OP. Secondarily, the characteristics of the population, the intervention protocols and the evaluation instruments are described.

METHODS

Protocol and registration

Rapid narrative synthesis systematic review (Grant & Booth, 2009; Tapia-Benavente et al., 2021) reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021).

Eligibility criteria for studies

Inclusion criteria

- **Population:** both sexes, ≥60 years, without restrictions on health condition or level of dependency.
- **Intervention:** MCT was considered under the following requirements: i) Incorporation of two or more exercise components (strength, aerobic, flexibility, balance, coordination, etc.), ii) Administered as a single intervention (not attached to other types of interventions such as physical agents, education, dual task, etc.).
- **Comparator:** different intervention modalities or non-intervened control groups.
- **Outcomes:** i) Measures related to mental health (e.g. depression, stress, anxiety, happiness, etc.), ii) Measures related to quality of life or health-related quality of life.
- **Types of study:** original articles in English, with experimental or quasi-experimental designs.

Exclusion criteria

Non-peer-reviewed articles, secondary studies, abstracts and grey literature.

Sources of information

Searches were conducted in the Pubmed and ScienceDirect databases between January 1, 2018, and September 26, 2023.

Search strategy

The strategy was guided by the guidelines of the Peer Review of Electronic Search Strategies (PRESS) (McGowan et al., 2016) considering key terms linked with Boolean operators OR and AND. The terms were: i) Population: aged (MeSH), elderly, “older adults”, ii) Intervention: “multicomponent exercise”, “multi domain exercise”, iii) “mental health” (MeSH), “Health-Related Quality of Life”.

Selection of studies

Records obtained from the databases were imported into the Rayyan platform. For selection, a title/abstract screening was first performed and then a full text review. This process was carried out by two authors independently and discrepancies were agreed upon with the participation of a third author.

Data Extraction

A standardized form was used that included: i) Metadata, ii) Population characteristics, iii) MCT protocols, iv) Outcome measures and assessment instruments for mental health and quality of life, v) Main results for the effects of the interventions (post-test). This process was carried out by two independent authors (C.S.M; J.C.P) and the homologation of the information was verified by a third author (P.M.A).

Risk of bias assessment

The Cochrane Collaboration's risk of bias (RoB) instrument was applied, which evaluates five dimensions (selection, performance, detection, attrition and reporting), as well as the possible identification of other risks (Higgins et al., 2011).

Synthesis strategy

The information was organized in summary tables and analyzed using a narrative synthesis.

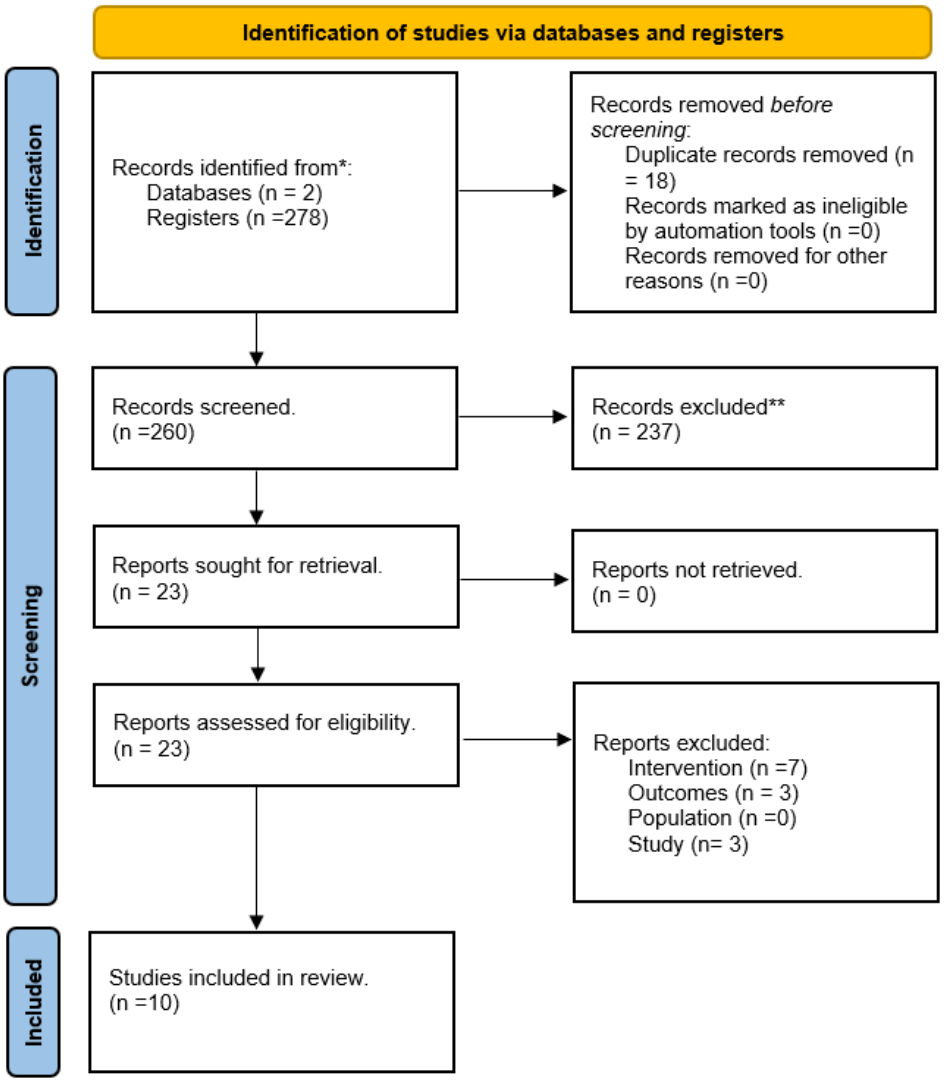
RESULTS

Search results

A total of 278 records were found. After removing duplicates, 260 records were screened by title/abstract and then 23 studies were reviewed in full texts, of which 10 were finally included. Figure 1 shows the flow chart for study selection.

Figure 1

Flowchart of study selection.



Characteristics of the included studies

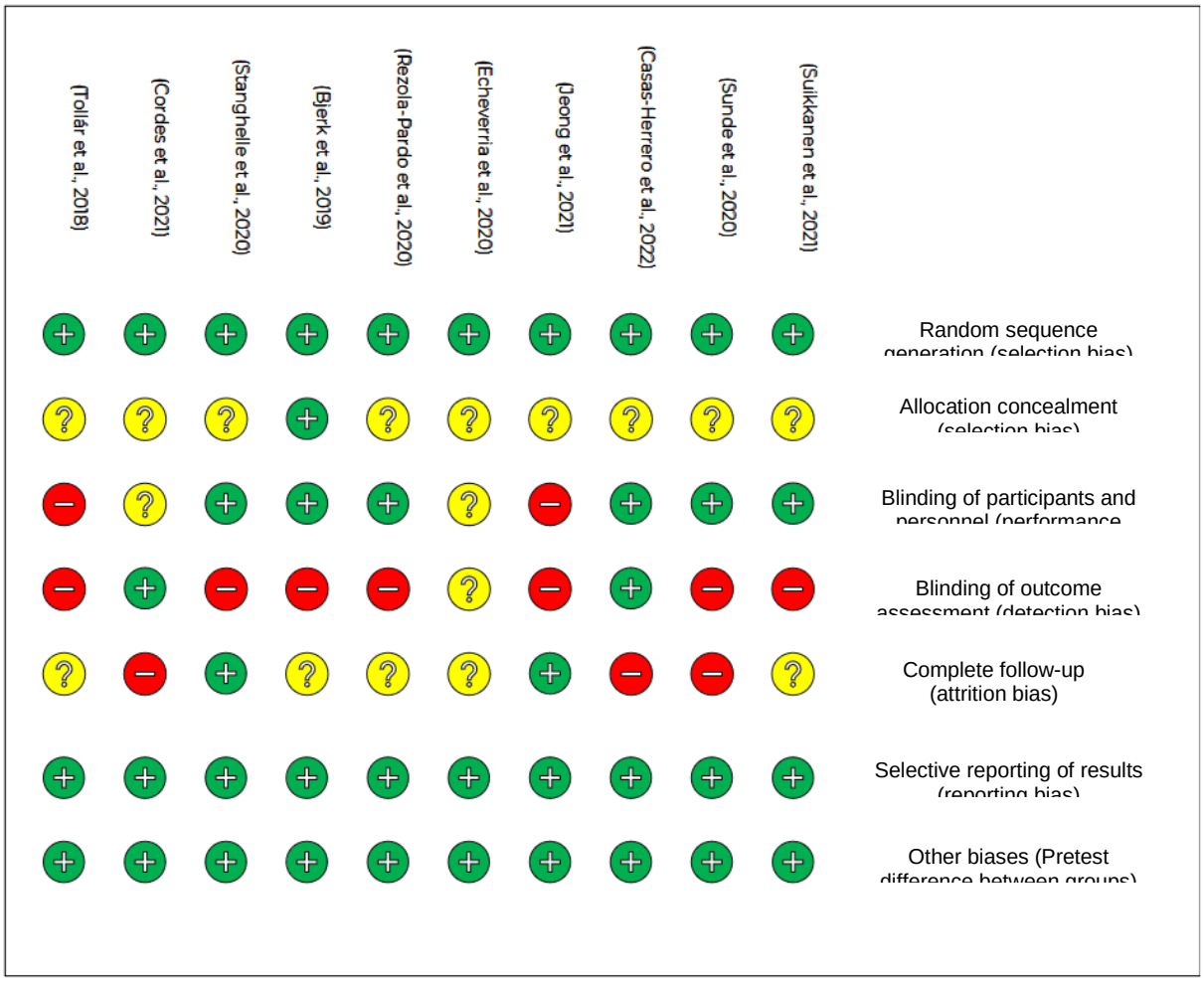
All studies were randomized controlled trials (RCTs). In seven studies, MCT was compared with a control group (Bjerk et al., 2019; Casas-Herrero et al., 2022; Cordes et al., 2021; Jeong et al., 2021; Stanghelle et al., 2020; Sunde et al., 2020; Tollár et al., 2018). In two studies, MCT was compared with another type of intervention such as usual care (Suikkanen et al., 2021) and walking (Rezola-Pardo et al., 2020). Finally, one study compared long-term MCT with short-term MCT (Echeverria et al., 2020). Three studies were conducted in Spain (Casas-Herrero et al., 2022; Echeverria et al., 2020; Rezola-Pardo et al., 2020), three studies were conducted in Norway (Bjerk et al., 2019; Stanghelle et al., 2020; Sunde et al., 2020) and one study was conducted respectively in Germany (Cordes et al., 2021), Finland (Suikkanen et al., 2021), Hungary (Tollár et al., 2018) and South Korea (Jeong et al., 2021).

Risk of bias assessment

Regarding the risk of selection bias due to random sequence generation, all articles present a low risk; however, only one study presents a low risk due to allocation concealment (Bjerk et al., 2019). Two studies present a high risk of performance bias (Jeong et al., 2021; Tollár et al., 2018), two studies present a low risk of detection bias (Casas-Herrero et al., 2022; Cordes et al., 2021) and two studies present a low risk of attrition bias (Jeong et al., 2021; Stanghelle et al., 2020), while in the others, some concerns or a high risk of bias are detected (Casas-Herrero et al., 2022; Cordes et al., 2021; Sunde et al., 2020). Regarding reporting bias and other biases, no concerns or a high risk are detected. The analysis of the individual studies is presented in Figure 2.

Figure 2

Risk of bias assessment according to tool.



Note. RoB Cochrane. *Low risk;* *Some concerns;* *High risk.*

Characteristics of subjects treated with MCT

The total number of subjects included was 1,162, with a mean age of 73 years (range 67 - 84 years), of whom 605 received MCT. 80.8% of subjects successfully completed the MCT protocols and outcome assessments, with the main reasons for discontinuation being various health conditions not attributed to the interventions or aggravated pre-existing health conditions. Regarding health conditions considering the total number of subjects, the percentages were: 44.5% frailty and mild cognitive impairment (Casas & Izquierdo, 2012; Jeong et al., 2021; Suikkanen et al., 2021), 5.5% Parkinson's disease (Tollár et al., 2018), 6.9% Alzheimer's disease (Rezola-Pardo et al., 2020), 12.8% osteoporosis (Stanghelle et al., 2020), 14.2% acute health conditions involving previous hospitalization (Echeverria et al., 2020; Sunde et al., 2020) and 16.1% reported no health conditions (Bjerk et al., 2019; Cordes et al., 2021). All studies reported equality between groups prior to the intervention. Table 1 summarizes the sample sizes, ages, and numbers of men and women in each study.

Measuring mental health and quality of life

Mental health and quality of life measures and instruments are presented in Table 1. Four studies did not consider any assessment related to mental health (Echeverria et al., 2020; Stanghelle et al., 2020; Suikkanen et al., 2021; Sunde et al., 2020) and four studies considered only one instrument to assess this indicator (Bjerk et al., 2019; Casas-Herrero et al., 2022; Jeong et al., 2021; Tollár et al., 2018), and only selected articles report two assessments related to mental health (Cordes et al., 2021; Rezola-Pardo et al., 2020), with depression being the most frequent variable.

Regarding quality of life, only one study did not consider this assessment (Jeong et al., 2021). The most frequent instruments were the SF-36 questionnaire (36-item short form survey instrument) (Bjerk et al., 2019; Stanghelle et al., 2020; Sunde et al., 2020) and the EQ-5D-5L (EuroQol Group 5 dimensions 5 Levels) (Casas-Herrero et al., 2022; Echeverria et al., 2020; Tollár et al., 2018).

Table 1

General characteristics of participants and outcome measures.

Author	Initial/final sample	Age, years (Mean±SD)	Men / Women (n)	Mental health variables/instrument					Quality of life variables / instrument		
				DEP	GWB	AF	LON	Otros	QLRH	DLA	Otros
(Tollár et al., 2018)	IG: 35/35 CG: 29/20	67.5±3.8	17/18	BDI	-				EQ-5D	SE ADL	PDQ-39
(Cordes et al., 2021)	IG: 26/19 CG: 26/19	81.0±11.0	19/33	CES-D	SF-12	-	-	-	SWLS	-	-
(Stanghelle et al., 2020)	IG:73 CG: 76	74.2±5.8	0/149	-	-	-	-	-	SF-36		QUALEFFO-41
(Bjerk et al., 2019)	IG: 78 CG: 77	82.7±6.7	33/122	-	-	-	-	FES-I	SF-36	-	-
(Rezola-Pardo et al., 2020)	MCG: 41/32 WG: 40/33	84.3±6.3	28/53	-	-	ADGS	JGLS	-	Qol-AD	-	-
(Echeverria et al., 2020)	SGB:27/19 LGB: 28/13	82.6±5.5	29/26	-	-	-	-	-	EQ-5D-5L	-	-
(Jeong et al., 2021)	CG: 15/13 IG: 15/13	71.0±6.5	8/22	SGDS-K	-	-	-	-	-	-	-
(Casas-Herrero et al., 2022)	CG: 100/72 IG:88/46	84.1±4.8	48/132	GDS	-	-	-	-	EQ-5D	-	-
(Sunde et al., 2020)	CG: 44/30 IG: 45/32	78.3±5.5	45/43	-	-	-	-	-	SF-36	-	-
(Suikkanen et al., 2021)	UCG: 149/118 PAC: 150/121	82.5±6.3	75/224	-	-	-	-	-	15DQ	-	-

Note. - Does not register; CG: Control group; IG: Intervention group; MCG: Multi-component group; WG: Walking group; SGB Short-term group-based branch; LGB long-term group-based branch; UCG: usual care group; PAC: Physical activity group; DEP: depression; BDI: Beck depression inventory; CES-D: Epidemiological studies depression scale; GWB: General well-being; QLRH: Quality of life related to health; AF: affective function; LON: Loneliness SWLS: Satisfaction with life scale; DLA: daily living activities; SE ADL Schwab and England Activities of Daily Living; EQ5D Five-dimensional EuroQoL Questionnaire; EQ-5D-5L EuroQol Group 5 dimensions 5 Levels; SF-36: 36-item short form survey instrument; PDQ-39: Parkinson's Disease Questionnaire-39; QUALEFFO-41: Life Questionnaire of the European Foundation for Osteoporosis; FES-I: Falls Efficacy Scale International; JGLS: Jong-Gierveld loneliness scale; Qol-AD: Quality of Life Alzheimer's Disease scale; SGDS-K: Korean version of the geriatric depression scale; GDS: Yesavage geriatric depression scale; 5DQ: 15D questionnaire.

Features of MCT protocols

Table 2 presents the main components of MCT protocols. On average, 36.7±24 sessions were reported, lasting 52.5±20 minutes and with a frequency of two to five sessions per week, with two sessions per week being the most common (Bjerk et al., 2019; Cordes et al., 2021; Echeverria et al., 2020; Jeong et al., 2021; Stanghelle et al., 2020). Forty percent of MCT protocols consider three or more components (Bjerk et al., 2019; Casas-Herrero et al., 2022; Rezola-Pardo et al., 2020). 80% considered strength training as part of the MCT mainly oriented to the lower extremities (Bjerk et al., 2019; Cordes et al., 2021; Echeverria et al., 2020; Rezola-Pardo et al., 2020; Stanghelle et al., 2020; Suikkanen et al., 2021; Sunde et al., 2020). 70% considered balance exercises focused on position changes and postural control (Bjerk et al., 2019; Casas-Herrero et al., 2022; Rezola-Pardo et al., 2020; Stanghelle et al., 2020; Suikkanen et al., 2021; Sunde et al., 2020; Tollár et al., 2018), or associated with specific gait training (Echeverria et al., 2020), to continue with mainly low-intensity aerobic exercise (Bjerk et al., 2019; Casas-Herrero et al., 2022; Jeong et al., 2021; Rezola-Pardo et al., 2020). Regarding warm-up and cool-down, 50% of the studies consider these components within their MCT protocols (Cordes et al., 2021; Echeverria et al., 2020; Jeong et al., 2021; Suikkanen et al., 2021; Tollár et al., 2018).

Table 2

Main features of MCT protocols.

Author	Total sessions	Frequency/ week	Time/session	Program name	MCT component							
					WU	SE	AE	BE	COOR	FLEX	WE	VD
(Tollár et al., 2018)	15	3	60 min	Multi-component Exercise Program	✓	-	-	✓	✓	-	-	✓
(Cordes et al., 2021)	32	2	60 min	Multi-component chair-based exercise program	✓	✓	-	-	✓	-	-	✓
(Stanghelle et al., 2020)	24	2	24 min	Resistance and balance exercise programme	-	✓	-	-	✓	-	-	-
(Bjerk et al., 2019)	36	3	30 min	Home-based falls prevention exercise	-	✓	✓	✓	-	-	-	-
(Rezola-Pardo et al., 2020)	24	2	60 min	Multi-component Exercise Program	-	✓	✓	✓	-	-	-	-
(Echeverria et al., 2020)	24	2	60 min	Group-Based and Home-Based Interventions	✓	✓	-	✓	-	-	-	✓
(Jeong et al., 2021)	24	2	90 min	Multi-Component Intervention Program	✓	-	✓	-	✓	-	-	✓
(Casas-Herrero et al., 2022)	60	5	30 min	Vivifrail multi-component exercise programme	-	✓	✓	✓	-	✓	✓	-
(Sunde et al., 2020)	32	2	-	High intensity Multi-component exercise program	-	✓	✓	✓	-	-	✓	-
(Suikkanen et al., 2021)	96	2	60 min	Home-based physical exercises	✓	-	✓	✓	✓	✓	✓	-

Note. ✓ Indicates component; - : Does not record; WU Warm-up; CD Cool-down; SE: Strength exercise; AE: Aerobic exercise; BE: Balance exercises; COOR: Coordination exercises; FLEX: Flexibility exercises; WE: Walking exercise.

Effects of MCT interventions

Table 3 presents the effects of the MCT. For depression, a decrease in questionnaire scores is reported, representing an improvement in depressive, anxious, and loneliness states, among others. Likewise, in health-related quality of life as the most frequent variable, an increase in general scores is reported after the MCT, meaning an improvement in this indicator.

For mental health, specifically in the depressive state, an improvement is detected in the intervention group over the control. Tollár et al. (2018) reports -18 points in the BDI ($p<0.05$) and Cordes et al. (2021), reports improvements in CESD-D and perception of well-being (SF-12), as do Jeong et al. (2021), Casas-Herrero et al. (2022) in their respective SGDSK and GDS assessments ($p<0.05$). On the other hand, Rezola-Pardo et al. (2020), in addition to the previously described evaluations, complements with favorable results in the improvement of anxiety (ADGS $p < 0.05$) and the perception of loneliness (JGLS $p < 0.05$).

Quality of life is analyzed in nine studies and in five significant improvements are reported in the comparison with controls. Tollár et al. (2018), find significant improvements in the three evaluation instruments. Therefore, Bjerk et al. (2019); Echeverria et al. (2020); Rezola-Pardo et al. (2020); Suikkanen et al. (2021), report significant favorable results compared to controls in their respective evaluation instruments. In the study by Echeverria et al. (2020), both protocols correspond to MCT, where the prolonged intervention group reports better results.

Table 3

Main effects of MCT on variables of interest.

Author	Mental health variables					Quality of life variables		
	DEP	GWB	AF	LON	Otros	QLRH	DLA	Otros
(Tollár et al., 2018)	↓ BDI *	-	-	-	-	↑ EQ-5D*	↑ SE ADL*	↑ PDQ-39*
(Cordes et al., 2021)	↓ CES-D	↑ SF-12	-	-	-	↑ SWLS	-	-
(Stanghelle et al., 2020)	-	-	-	-	-	↑ SF-36	-	↑ Qualeffo-41
(Bjerk et al., 2019)	-	-	-	-	↑ FES-1	↑ SF-36*	-	-
(Rezola-Pardo et al., 2020)	-	-	↓ ADGS*	↓ JGLS	-	↑ QoL-AD*	-	-
(Echeverria et al., 2020)	-	-	-	-	-	↑ EQ-5D-5L*	-	-
(Jeong et al., 2021)	↓ SGDS-K	-	-	-	-	-	-	-
(Casas-Herrero et al., 2022)	↓ GDS*	-	-	-	-	↑ EQ-5D	-	-
(Sunde et al., 2020)	-	-	-	-	-	↑ SF-36	-	-
(Suikkanen et al., 2021)	-	-	-	-	-	↑ 15 DQ*	-	-

Nota. ↓ *: Decrease;* ↑ *: Increase; *: p<0.05; - Does not register; DEP: depression; BDI: Beck depression inventory; CES-D: Epidemiological studies depression scale; GWB: General well-being; QLRH: Quality of life related to health; AF: affective function; LON: Loneliness SWLS: Satisfaction with life scale; DLA: daily living activities; SE ADL Schwab and England Activities of Daily Living; EQ5D Five-dimensional EuroQoL Questionnaire; EQ-5D-5L EuroQol Group 5 dimensions 5 Levels; SF-36: 36-item short form survey instrument; PDQ-39: Parkinson's Disease Questionnaire-39; QUALEFFO-41: Life Questionnaire of the European Foundation for Osteoporosis; FES-I: Falls Efficacy Scale International; JGLS: Jong-Gierveld loneliness scale; Qol-AD: Quality of Life Alzheimer's Disease scale; SGDS-K: Korean version of the geriatric depression scale; GDS: Yesavage geriatric depression scale; 5DQ: 15D questionnaire.*

DISCUSSION

The purpose of this exploratory review was to describe MCT protocols in older people and their effects on variables related to mental health and quality of life. From this review, 10 articles were reviewed that reported being mostly randomized clinical trials with randomization of the sample, follow-up and consistent evaluation of results, which considered a total of 1162 people with a mean age of 78 years, reporting an adherence to MCT protocols of 80%, similar to the results by Cárcamo-Regla et al. (2021).

In general terms, the representativeness of female OP reports an important sociodemographic behavior oriented to the fact that a large part of older people are women due to the longer life expectancy, in turn, a greater interest and adherence by female subjects to physical exercise can be presumed, consistent with the results of other reviews (Liu et al., 2023). In the articles selected for the review, variables associated with mental health and quality of life are reported in general terms as secondary study variables, without showing a greater predominance over physical performance assessments, consistent with what was indicated by Angulo et al. (2020), where variables linked to mental health and quality of life associated with the aging process are not considered as a primary outcome.

For mental health variables, instruments that assess levels of depression tend to be more common to consider the variable, although there is not a sufficient frequency to consider the indicator as a standardized assessment in older people and, in turn, standardized instruments to assess or detect depressive states in OP are not reported (Otto et al., 2021); other variables related to mental health that are reported within the selected studies are related to general well-being, affective function and perception of loneliness.

Although positive effects of MCT on the general health of the user can be considered, within the selected articles all report improvements in terms of the general reduction of the perception of depressive states, no decisive results are reported regarding statistical significance and effect sizes, although the evidence reports that physical exercise regardless of its modality improves depressive states in older people (Ahn & Kim, 2023). Liu et al. (2023) mention that MCT is a type of exercise that can improve depression in older adults. In turn, it has been shown that the significant improvement in depression also depends on the frequency of training (Zhang et al., 2017).

Regarding the perception of quality of life related to health, it tends to be a frequent indicator within the selected studies, coinciding with what was indicated by Song et al. (2023), so this assessment can be considered in a standardized way in clinical practice, mainly the SF-36 and the Eq-5D-5L, as a starting point to assess health-related quality of life, in order to evaluate post-intervention results and consider this variable as an indicator above physical performance (Cheng et al., 2023).

In the results of the present review, three of the nine studies that report HRQOL present significant results in this variable, although it contrasts with what was proposed by Yi et al. (2023), who indicate quality of life as a variable that does not report significant changes after training protocols, so greater consideration and monitoring of this variable is needed, being consistent with what was stated by Cheng et al. (2023) where quality of life is maintained as a secondary variable within studies that seek to evaluate the effects of interventions focused on physical activity.

When developing an MCT program, a thorough evaluation of the subject is necessary to choose which modality is most appropriate, and it is advisable that the physiotherapist periodically asks the participant about the level of fatigue they experience during the activity and helps them maintain the level of effort within acceptable parameters (Bisbe et al., 2020). Compared to the characteristics of MCT applied to OP, in terms of duration, training routines are achieved in a range of 30 to 50 minutes, with an average of 50 minutes per session, at a frequency of twice a week on a regular basis, similar to what Yi et al. (2023) proposes, in a meta-analysis that reviews the effects of Otago exercises in older people. The selection of the modality can also adequately incorporate balance and coordination exercises, which also stimulate cognition in the sensory and motor systems, and their regular practice can induce beneficial adaptations in brain function (Bisbe et al., 2020). The authors of the articles selected for the review agree that greater frequency and intensity of training are necessary in order to generate deeper adaptations.

The strength training component in these training methodologies is highlighted, considering strength as an important indicator of survival in OP, reducing the risk of falling, impacting balance and coordination, improving gait and, therefore, reducing the risk of falling in the subjects involved, consistent with the results of other reviews (Liu et al., 2023; Yi et al., 2023). In turn, this impact on physical health can mean a better perception of quality of life by achieving better functional capacity, reduced

fear of falling and, likewise, greater tolerance to physical effort, promoting greater social participation by older people.

The selected articles report in their main recommendations that MCT is preferable over other OP-oriented interventions (Rezola-Pardo et al., 2020; Echeverria et al., 2020; Casas-Herrero et al., 2022), considering the respective accompaniment of physiotherapist professionals (Stanghelle et al., 2020; Bjerk et al., 2019). Regarding the planning of MCT protocols, frequency and intensity can be a determining factor when implementing this training methodology if significant changes are to be made to the health of users (Tollár et al., 2018; Jeong et al., 2021), considering intensity as a determinant if deep adaptations are to be achieved (Cordes et al., 2021). On the other hand, a stratification of the subjects based on age range is recommended, in order to improve the accuracy of the results (Tollár et al., 2018)

The selected articles report recommendations that mention the need to categorize the OP according to their age in order to specify effects and, in turn, increase the frequency and intensity of the MCT sessions to deepen the adaptations to training, under the recommended supervision of physical therapy professionals.

Limitations

Limitations are reported related to the small number of articles available for review related to the analysis of mental health variables of older people after multicomponent training.

Furthermore, the results are limited because screening related to the level of dependency and institutionalization of the subjects is not carried out.

CONCLUSION

Based on the results obtained in this review and the subsequent analysis, it is concluded that multicomponent training in older people reports benefits on mental health and perception of quality of life, although there are no statistical significances that absolutely recommend MCT protocols to improve the mentioned variables, considering also that frequent evaluation protocols are reported that allow to cohere the effects in a more precise way.

It is recommended to implement MCT protocols in order to improve the health of older people and positively impact their perception of mental health and quality of life. Although there is the challenge of considering these variables in a primary way with similar and varied evaluation strategies in order to better specify their results.

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Received: 09-04-2024
Accepted: 21-05-2024