Effects of multicomponent training on functional capacity and anthropometric indices in postmenopausal women: a pilot study

Efectos del entrenamiento multicomponente sobre la capacidad funcional y los índices antropométricos en mujeres posmenopáusicas: un estudio piloto

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Abstract

Introduction: Multicomponent Training (MT) is a method that emphasizes multiple physical qualities related to daily life. Thus, it is believed that MT can generate important changes in components of functional capacity and anthropometric indices of postmenopausal women. As observed in other models of physical exercise, since it involves physical effort that follows the same biological and methodological principles as sports training, it can generate positive stimuli for muscle mass gain and reduction of body fat deposits, thereby reflecting an improvement in activities of daily living.
Objective: To evaluate the effects of the MT program on the functional capacity and anthropometric indices of postmenopausal women.
Methods: Thirty women were allocated to the MT (n=15; 64.4 ± 3.1 years, 29.5 ± 4.8 kg/m^2) and Control Group (CG) (n=15; 63.5 ± 4.3, 31.2 ± 5.6 kg/m^2). The training protocol lasted 12 weeks. The functional capacity assessment was based on the following time-based tests: Put on and take off a t-shirt (PTS); Five times sit-to-stand test (FTSST); Standing up from the prone position (SPP); Sit and get up from the chair and move around the house (SCMA); and Gallon-Jug Shelf-Transfer Test (GJST). Anthropometric indices consisted of the waist-hip ratio and body mass index.
Results: The MT promoted a reduction in the time required to perform the Tests of PTS (Pre=14.1 ± 2.8; Post=12.8 ± 2.4; p<0.05), FTSST (Pre=7.74 ± 1.5; Post=5.9 ± 1.2 p<0.05); SPP (Pre=2.75 ± 1.2; Post=2.27 ± 0.6; p<0.05), SCMA (Pre= 34.39 ± 4.2; Post=31.3 ± 4.4; p < p<0.05), and GJST (Pre=10.82 ± 1.2; Post = 9.43 ± 1.1; p<0.05) when compared to the CG and over time. However, no differences in anthropometric indices were detected.
Conclusion: MT effectively improves the functional capacity of postmenopausal women but does not induce changes in anthropometric indices.

Keywords

Exercise; activities of daily living; aging; personal autonomy; health.

Resumen

Introducción: El entrenamiento multicomponente (EM) es un método que hace hincapié en múltiples cualidades físicas relacionadas con la vida cotidiana. Por lo tanto, se cree que el EM puede generar cambios importantes en los componentes de la capacidad funcional y los índices antropométricos de las mujeres posmenopáusicas. Al igual que los observados en otros modelos de ejercicio físico, dado que se trata de un esfuerzo físico que sigue los mismos principios biológicos y metodológicos del entrenamiento deportivo, es capaz de generar estímulos positivos para el aumento de la masa muscular y la reducción de los depósitos de grasa corporal, lo que se refleja en la mejora de las actividades de la vida diaria.
Objetivo: Evaluar los efectos del programa de EM sobre la capacidad funcional y los índices antropométricos de las mujeres posmenopáusicas.
Métodos: Se asignó a treinta mujeres al grupo EM (n = 15; 64,4 ± 3,1 años, 29,5 ± 4,8 kg/m^2) y al grupo de control (n = 15; 63,5 ± 4,3, 31,2 ± 5,6 kg/m^2). El protocolo de entrenamiento duró 12 semanas. La evaluación de la capacidad funcional se basó en las siguientes pruebas cronometradas: ponerse y quitarse una camiseta (PQS); levantarse de una posición sentada (LPS); levantarse desde la posición boca abajo (LPA), sentarse y levantarse de la silla y moverse por la casa (SLMC); y prueba de transferencia de jarra de galón a estante (TJGE) índices antropométricos consistieron en la relación cintura-cadera y el índice de masa corporal.
Resultados: El EM promovió una reducción en el tiempo necesario para realizar las pruebas de PQS (Pre=14,1 ± 2,8; Post=12,8 ± 2,4; p<0,05); LPS (Pre=7,74 ± 1,5; Post=5,9 ± 1,2 p<0,05); LPA (Pre=2,75 ± 1,2; Post=2,27 ± 0,6; p<0,05), SLMC (Pre= 34,39 ± 4,2; Post=31,3 ± 4,4; p < p<0,05), y TJGE (Pre=10,82 ± 1,2; Post = 9,43 ± 1,1; p<0,05) en comparación con el grupo de control y a lo largo del tiempo. Sin embargo, no se detectaron diferencias en los índices antropométricos.
Conclusión: La EM mejora eficazmente la capacidad funcional de las mujeres posmenopáusicas, pero no induce cambios en los índices antropométricos.

Palabras clave

Ejercicio; actividades de la vida diaria; envejecimiento; autonomía personal; salud.

Introduction

Different physiological changes occur in women with advancing age, especially during and after menopause (Abildgaard et al., 2013; El Khoudary et al., 2020). These changes include a marked decrease in female sex hormones, increased adiposity, reduced muscle mass, and lower resting energy expenditure (Diniz et al., 2017). Moreover, observational studies have shown a positive association between waist circumference (WC) and frailty (Reinders et al., 2017). Therefore, a greater WC is associated with a higher probability of frailty among older women (Uchai et al., 2023).

The postmenopausal period is associated with a higher prevalence of overweight and obesity, reduced quality of life, cardiovascular complications, and a greater susceptibility to endocrine disorders (Motlani et al., 2023; Chen et al., 2021; Gonçalves et al., 2016). Consequently, a progressive increase in Body Mass Index (BMI) raises the risk of cardiovascular disease, stroke, diabetes, and cancer (Mehran et al., 2024; Powell-Wiley et al., 2021).

In parallel, postmenopausal women often experience a decline in functional capacity, which increases the risk of falls and dependency (Buckinx & Aubertin-Leheudre, 2022; Cerón Lorente et al., 2019; Borba-Pinheiro et al., 2016). These differences manifest differently across the lifespan for men and women, with women showing a great propensity loss of muscle mass due to the reduction in estrogen availability after menopause. Estrogen plays a crucial role in limiting adipogenesis and regulating muscle signaling related to repair and regeneration (JafariNasabian et al., 2017; Marsh et al., 2023). Moreover, sarcopenia affects muscle groups differently, with more deleterious effects on the lower limbs, which may be explained by a greater reduction in motor neurons in the lumbar region (Buckinx & Aubertin-Leheudre, 2022).

The MT has proven effective for improving functional capacity in older women and individuals with type 2 diabetes mellitus (Heubel et al., 2018; Martinez-Navarro et al., 2021). However, the terminology "multicomponent training" (MT) remains somewhat inconsistent in the literature. While some studies define it as the combination of only two physical components, the most widely accepted perspective characterizes it as the integration of three or more physical capacities within a single training session (Leitão et al., 2022; Lemos et al., 2020; Teixeira et al., 2017). MT is a training method that emphasizes multiple physical capacities relevant to daily life. It is hypothesized that MT can promote meaningful improvements in functional capacity and anthropometric parameters in postmenopausal women. Similar to other structured exercise models, MT adheres to the same biological and methodological principles of sports training, potentially inducing positive adaptations such as increased muscle mass and reduced body fat, thereby enhancing the performance of activities of daily living (Bouaziz et al., 2016; Izquierdo et al., 2019; Lemos et al., 2020).

Evaluating the effects of different exercise modalities on daily functional tasks has been extensively explored in the scientific literature concerning older women. Nevertheless, the present study aimed to quantify the magnitude of the effects of our MT program, providing both the general population and health professionals with more accurate recommendations. Older adults frequently experience declines in functional capacity that can compromise independence and quality of life. Effective exercise prescription therefore requires careful consideration of variables such as intensity, duration, and type of exercise. However, some aspects of MT application remain to be fully understood. Further research is needed to examine the effects of MT on functional capacity and anthropometric outcomes in postmenopausal women, in accordance with the American Heart Association and the Position Statement on Women's Cardiovascular Health (Forman et al., 2017; Oliveira et al., 2022). Moreover, a better understanding of neuromuscular efficiency is required to meet the specific demands of daily life activities (Stenger, 2018). Based on these considerations, the present study analyzed the effects of 12 weeks of MT on functional capacity and anthropometric indices in postmenopausal women. We hypothesized that MT would improve these parameters.

Method

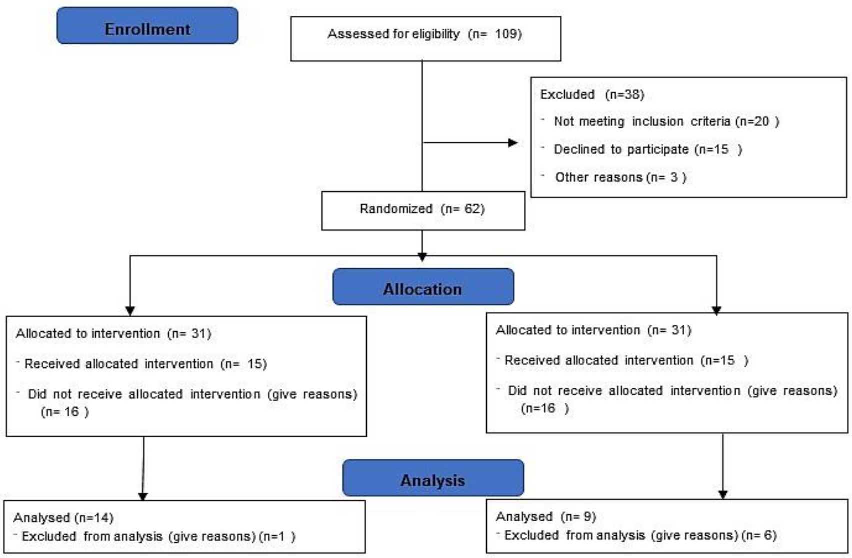
Experimental Design

This study was a randomized, single-blind, two-group, controlled clinical pilot trial conducted over 12 weeks (April to June 2019), with an additional 2 weeks allocated for baseline and post-intervention assessments. Randomization was stratified, meaning that participants were first divided into strata and then randomly assigned within each stratum to ensure balanced group distribution. The training intervention was implemented at the Federal University of Sergipe and lasted for 12 consecutive weeks (weeks 0–12). All variables were standardized and measured to detect potential variations between training protocols and to minimize confounding factors, in accordance with the CONSORT guidelines (Schulz et al., 2011). Ethical approval was obtained from the Research Ethics Committee of the Federal University of Sergipe (CAAE: 96105118.6.0000.5546). The study was conducted in accordance with the principles of the Declaration of Helsinki and registered with the Brazilian Clinical Trials Registry (ReBEC) under the identifier RBR-89KCHG.

Participants

Thirty postmenopausal women were randomly assigned to one of two groups in a 1:1 ratio: a MT and a CG. The inclusion criteria were as follows: being female; absence of menstrual bleeding for at least 12 months; age ≥ 60 years; ability to walk independently; and no history of recent surgery, deep brain stimulation, or neurological disorders. Participants were excluded from the final analysis if they missed more than 25% of the training sessions, failed to complete the post-intervention assessment, modified the prescribed exercise routine, or engaged in any additional structured physical training during the study period. All participants were fully informed about the study procedures and provided written informed consent prior to participation.

Figure 1. Detailed information about participant selection and maintenance throughout.



Procedure

Training Intervention

The intervention consisted of 36 training sessions conducted on non-consecutive days over a 12-week period. Each session lasted approximately 50 minutes and was divided into two parts. The first part comprised 15 minutes of interval walking, alternating 30 seconds at a usual pace and 30 seconds at a faster pace. After a 2-minute rest period, participants completed the second part, which involved resistance training performed in a circuit format lasting approximately 30 minutes. The exercises were primarily machine-based (Table 1). All resistance exercises were performed at maximal concentric velocity, alternating between upper and lower body segments. Load control was based on the OMNI-GSE scale of perceived exertion, with a repetition range of 8 to 12 repetitions (Da Silva-Grigoletto, 2013). Load progression followed an adaptive approach: when a participant completed more than 12 repetitions, the load was increased by 5%; conversely, when fewer than 8 repetitions were completed, the load was reduced by 5%.

Table 1. Multicomponent training

Multicomponent training		
Parts	1st part	2nd part
Exercises	Interval walking - 30s at the usual pace/ 30s walking faster over 86 m.	Bench press
		Leg extension
		Seated row (neutral grip)
		Deadlift
		Lat pulldown
		Standing calf raise (bilateral)
		Shoulder press
		Romanian deadlift (stiff-leg deadlift)
Training parameters	Total time: 15 min; 15 rounds; Rpe: 4-5	Total time: 32 min; 8 exercises; 2 rounds; 8-12 repetitions – 30 s of exercise /90 s of rest - density 1:3 rpe: 6-7

Note: (RPE: Rating of Perceived Exertion; Min: minutes)

The CG performed static stretching exercises at submaximal range of motion, completing three to four sets of 20 seconds for each of the major and secondary muscle groups, including the gluteus, quadriceps, pectoralis major, and latissimus dorsi.

Collection Procedures

All testing procedures were conducted in the early morning (7:00 a.m.) in the following sequence: anthropometric assessments followed by functional capacity tests. All functional measurements were performed on the same day, with a minimum interval of 48 hours between training sessions to avoid residual fatigue. The evaluators were blinded to the participants' group allocation. Functional capacity tests were administered in the following order: Put on and take off a t-shirt (PTS), Five times sit-to-stand test (FTSST), Standing-up from Prone Position Test (SPP), Sit, Get up from a Chair, and Move Around the House Test (SCMA), and the Gallon-Jug Shelf Transfer Test (GJST). A minimum rest interval of 5 minutes was provided between each test to allow for adequate recovery and to minimize interference between assessments. Verbal encouragement was provided throughout all functional capacity tests to ensure maximal participant effort.

Anthropometric Indices

We measured the total body mass and height of the participants in an orthostatic position, barefoot, and wearing light clothing. A scale (Lider®, P150C, Ribeirão Preto, São Paulo, Brazil) was used for body weight, and height was measured with a stadiometer (Sanny®, ES2030, Araraquara, São Paulo, Brazil). The BMI was calculated as the ratio of mass (Kg) to the square of height (m^2) (ACSM, 2014).

Waist and hip circumference

WC and hip circumference (HC) were measured using a non-elastic measuring tape. WC was measured at the point between the lower costal border and the iliac crest, and HC was based on the largest portion of the gluteus maximus. The final data resulted from the ratio between the two measurements. If the difference between the first two measurements is equal to or greater than 2 cm, a third measurement is taken, and the mean is calculated (De Koning et al., 2007). Finally, the ratio between WC and HR yields the Waist-to-Hip Ratio (WHR).

Functional Capacity

Put on and take off a t-shirt (PTS)

Participants were instructed to stand upright with their arms relaxed at their sides, holding a T-shirt in one hand. At the verbal command “Go,” they were required to put on the T-shirt completely and then immediately remove it, returning to the initial position. Furthermore, this test assesses upper-limb agility and coordination. Each participant performed three trials, with a 30-second rest interval between attempts, and the fastest time was recorded for analysis. The attempt was considered invalid if the participant started the movement with one hand and finished with the other (Vale et al., 2006).

Five times sit-to-stand test (FTSST)

The test begins with the individual standing on a chair without armrests, with the seat positioned 50 cm above the floor. Then, the individual rises and sits five consecutive times. Each participant has three attempts with a five-minute interval; the shortest time is accepted. The test is invalidated if the participant does not touch her buttocks to the chair. The test aims to evaluate the power of the lower limbs (Guralnik et al., 1994).

Stand up from Prone Position (SPP)

Participants started in the prone position with their arms alongside the body. At the verbal command “Go,” they were instructed to stand up as quickly as possible and maintain a stable standing posture. Each participant completed three trials, separated by 30-second rest intervals, and the fastest time was recorded for analysis. A trial was considered invalid if the participant-initiated movement before the command or failed to follow the evaluator’s execution instructions, the purpose of this test is to evaluate the participant’s ability to rise from the floor, reflecting global motor control, coordination, and agility (Alexander et al., 1997).

To sit and get up from the chair and move around the house (SCMA)

A chair was fixed to the floor, and two cones were positioned diagonally behind the chair, each located 4 meters behind and 3 meters to the right and left of the chair, respectively. Participants began the test seated on the chair with both feet flat on the floor. At the verbal command “Go,” they were instructed to stand up, move to the right, circle the cone, return to the chair, sit down, and lift both feet off the floor. Without pausing, they repeated the same movement to the left side. Immediately afterward, participants completed the same sequence once more (right and left), thus circling each cone twice in total. Each participant performed three trials, and the fastest time was recorded for analysis. A trial was considered invalid if the participant failed to correctly navigate the cones or stopped during the execution of the test, the purpose of this test is to assess agility and dynamic balance in older women (Andreotti & Okuma, 1999).

Gallon Jug Shelf Transfer Test (GJST)

Participants stood sideways to a bookshelf (2.13 × 1.06 m, adjustable shelves), with the upper shelf positioned at shoulder height and the lower shelf at patellar height. Five-gallon jugs (carboys), each weighing 3.9 kg, were placed side by side on the lower shelf. The evaluator first demonstrated the procedure, after which participants received the following instructions: maintain a straight back, always use the same hand to move the jugs, engage the lower limbs to assist the movement, and stop immediately in case of pain or discomfort. Each participant performed one familiarization trial under evaluator supervision to ensure proper technique. During the test trials, only reminders to use the lower limbs were allowed. At the evaluator’s verbal command “Go,” participants transferred all five jugs from the lower shelf to the upper shelf and back as quickly as possible. Each participant completed three timed trials, separated by one-minute rest intervals, and the fastest time was used for analysis. General functionality, with an emphasis on upper-limb strength and coordination, which simulates the daily task of lifting and transferring gallon jugs on a shelf, a trial was considered invalid if the participant moved more than one jug simultaneously or alternate hands during execution. The test demonstrated excellent reliability, with an intraclass correlation coefficient (ICC) of 0.97 (Signorile et al., 2006).

Statistics Analysis

Data was analyzed using Jamovi software (version 2.3.18.0; The Jamovi Project, 2022). Descriptive statistics were presented as measures of central tendency and dispersion for the MT and CG samples. The Shapiro–Wilk test was applied to assess data normality, and the Levene test to verify homogeneity of variances. When the data met the assumptions of normality and homogeneity, Analysis of Variance

(ANOVA) was used for parametric comparisons. Otherwise, the Kruskal–Walli's test was applied for non-parametric data, based on the differences between pre- and post-intervention measures. Statistical significance was set at $p < 0.05$. Additionally, Hedges' g effect size was calculated to provide a qualitative interpretation of the magnitude of change, classified as small (g = 0.2), medium (g = 0.5), and large (g = 0.8) (Cohen, 1988).

Results

Thirty participants took the intervention and twenty-three of them performed the pre- and post-tests.

Table 2. Descriptive data for age, weight, height, and BMI.

Variable	MT (n = 14) ME/SD	CG (n = 9) ME/SD	P-valor
Age (years)	64.4 ± 3.1	63.5 ± 4.3	0.583
Weight (kg)	71.9 ± 8.3	73.4 ±12.6	0.743
Height (cm)	156.6 ± 6.4	153.2 ± 3.9	0.170
BMI (kg/m²)	29.5 ± 4.8	31.2 ± 5.6	0.447

Legend: ME = Mean; SD = Standard Deviation; kilograms (kg); centimeters (cm); meter squared (m²).

Significant time, group, and time × group interaction effects were observed for several variables. Specifically, there were time effects for the SPP, FTSST, and GJST tests; group effects for the PTS, SPP, SCMA, and GJST tests; and time × group interactions for the PTS, SPP, SCMA, FTSST, and GJST tests. In the PTS, a significant interaction effect was found, $F (1, 21) = 6.435$, $p = 0.01$, $\eta^2 = 0.23$. Post-hoc comparisons revealed a significant improvement in the MT group ($p = 0.02$), whereas no significant changes were observed in the CG. Execution time decreased in the MT group and increased in the CG. In the SPP, there was a significant interaction effect, $F (1, 21) = 31.143$, $p < 0.001$, $\eta^2 = 0.59$. Between-group comparisons showed differences at post-test ($p < 0.001$). Additionally, execution time decrease significantly in both groups, with effect in the MT group ($p = 0.01$ for MT; $p < 0.001$ for CG). For the SCMA, a significant interaction effect was observed, $F (1, 21) = 7.934$, $p = 0.01$, $\eta^2 = 0.27$. Post-hoc analysis indicated significant between-group differences at post-test ($p = 0.01$). In the FTSST, a significant interaction effect was detected, $F (1, 21) = 18.962$, $p < 0.001$, $\eta^2 = 0.47$.

Table 3. Values of anthropometric indices and functional capacity tests were measured before and after 12 weeks of follow-up.

	Experimental Protocol							
	MT (13)		CG (9)		p-valor			
Variable	Pre ME±SD	Post ME±SD	Pre ME±SD	Post ME±SD	Time	Group	Time*Group	Effect size [ES]/CI
AB (cm)	95.08 ± 9.00	95.70 ± 9.80	103.0 ± 12.40	104.70 ± 14.40	0.28	0.10	0.25	-0.73 [-1.58 - 0.12]
WC (cm)	90.80 ± 11.00	89.70 ± 8.60	100.50 ± 13.80	100.40 ± 12.50	0.45	0.04	0.53	-1.00 [1.86 - 0.13]
HC (cm)	105.30 ± 6.60	105.10 ± 7.00	107.80 ± 13.80	107.30 ± 13.80	0.51	0.59	0.73	-0.21 [-1.03 – 0.61]
WHR	0.86 ± 0.08	0.85 ± 0.05	0.93 ± 0.08	0.98 ± 0.04	0.17	<000.1	0.05	-2.70 [-3.85 -1.56]
PTS (s)	14.10 ± 2.80	12.80 ± 2.40*	14.60 ± 2.40	15.60 ± 1.70	0.67	0.09	<000.1	-1.25 [-2.15 -0.36]
FTSST (s)	7.74 ± 1.50	5.90 ± 1.20*	8.70 ± 0.60	8.30 ± 0.80	<000.1	0.002	<000.1	-2.18 [-3.22 - 1.14]
SPP (s)	2.75 ± 1.20	2.27 ± 0.60*	3.20 ± 1.00	4.40 ± 1.60	0.02	0.009	<000.1	-1.84 [-2.82 -0.86]
SCMA (s)	34.39 ± 4.40	31.30 ± 4.50*	34.30 ± 7.10	36.40 ± 4.20	0.57	0.20	0.01	-1.12 [-2.00 - 0.24]
GJST (s)	10.82 ± 1.20	9.43 ± 1.10*	12.10 ± 1.00	11.90 ± 1.40*	0.004	0.001	0.03	-1.93 [-2.93 - 0.94]

Legend: AB = Abdominal Circumference; Cm= centimeters; FTSST= five times sit-to-stand test; GJST = Gallon Jug Shelf Transfer Test; HP = Hip Circumference; PTS = Put on and Take off a t-shirt Test; S=seconds; SCMA= To Sit and Get Up from the Chair and Move Around the House; SPP=Stand up from Prone Position Test; FTSST=Five times sit-to-stand test; WC=Waist Circumference; WHR = Waist-to-Hip Ratio.

Complementarily, among the multiple comparisons, a significant difference was observed; specifically, time showed a difference between the means ($p < 0.001$) in the MT group ($p < 0.001$). In the GJST test, we detected decrease in execution, with time F interaction effect $(1.21) = 5.067$, $p = 0.035$, $\eta^2 = 0.19$. Additionally, in multiple comparisons, a significant difference was observed between times pre and post in the MT. There were no statistical differences in anthropometric index variables after the intervention in either the MT or the CG.

Discussion

The present research evaluated the functional capacity and anthropometric indices of post-menopausal women. Our results demonstrate that women participating in 12-week MT program experience improvements in functional capacity. In the anthropometric indices, we did not detect changes in any of the variables. This is justified by the fact that these variables require more time for positive changes in post-menopausal women (Echeverria et al., 2020).

Thus, training-related functional adaptations were identified in all functional capacity tests in the MT group, while the CG obtained statistically significant improvements only in the SPP. In the study by Resende-Neto et al. (2021), statistical improvements were observed in balance and gait speed tests, as well as lower limb power. These improvements were confirmed by tests such as SCMA and FTSST, which validated the type of training developed in the research and demonstrated physiological adaptations resulting from exercise. In this sense, functional capacity plays a significant role in addressing the morphophysiological characteristics of postmenopausal women, particularly the loss of lower limb power resulting from the decrease in type II fibers. Moreover, these changes can impair daily tasks, such as squatting and carrying (Aragão-Santos et al., 2020; Martinez-Navarro et al., 2021; Resende-Neto et al., 2021).

In addition, adaptations in the improvement of functional capacity are also commonly observed in strength training, when composed of multi-joint exercises performed with full range of motion, thus being complemented and guaranteed by other sets of the session, through mechanisms such as increased production of synovial fluid, reduction of non-contractile tissues in the cross-sectional area and the muscle spindle firing rate (Bezerra et al., 2018; Hughes et al., 2018). Concerning cardiorespiratory capacity, it appears that the metabolic characteristics of high-intensity interval exercise, together with the central circuits present in the MT set, may enhance aerobic performance by inducing central (e.g., increase in pulmonary oxygen diffusion, maximal cardiac output, and affinity between oxygen and hemoglobin) and peripheral (e.g., increase in glycogen, myoglobin content, pericardial capillarization, mitochondrial volume, and enzymatic activity) adaptations, resulting in changes in the mechanisms of oxygen transport and utilization, such as increased oxidative capacity of the muscle cell, increased breakdown of glycogen and phosphate, and improved utilization of intramuscular triglycerides (Ito et al., 2024; MacInnis & Gibala, 2017).

Our study corroborates the findings of Suzuki et al. (2018), who demonstrated that a MT program conducted at maximum concentric velocity led to adaptations in variables such as FTSST, SPP, SCMA, and PTS, supporting the effectiveness of MT programs in performing activities of daily living. In this sense, the MT program is an applicable model for women over 60 years old. It seeks to stimulate different physical capacities in the same training session and can attenuate age-related functional declines. It is worth mentioning that the meta-analysis by Lemos et al. (2020) identified that both strength training and MT are relevant when the objective is specific to activities of daily living.

In the study by Balachandran et al (2016), it was not even possible to identify statistical differences in the GJST variable, which refers to the identification of a smaller volume of weekly training as a factor that can interfere with the results. Aragão-Santos et al. (2021) decreased test reproduction time, highlighting the specificity of using multi-item machines that resemble movement patterns. This leads us to consider how activities of daily living relate to movement patterns involving pushing, pulling, and squatting. Thus, the study corroborates data on the adherence of health agencies to the use of this type of intervention in political proposals, aimed at improving the quality of life and physical fitness of postmenopausal women in practical application (Gaviria Chavarro et al., 2025; Souza Guerra et al., 2019). According to the American College, regular physical activity has been shown in the literature to improve functional health (for older adults), with moderate to strong evidence, for this reason, our training program for older women could be an alternative in the face of functional decline and body composition variables, in addition to being a trend in Ibero-American fitness trends for 2025 (Palos et al., 2025; Bushman, 2017).

The present study has some limitations, including the sample size, which may lead to a Type II error. It is worth noting that, as this is a pilot study with the objective of training to improve measures for a future study, the measures may contain errors; however, all possible precautions have been taken. The results can help physical education and physical therapy professionals evaluate, prescribe, and monitor exercise variables for postmenopausal women to improve their functional capacity.

Conclusions

The MT is effective in improving the functional capacity of postmenopausal women. Thus, the work demonstrates that the combination of different activities, such as, for example: mobility, strength, power, and resistance, at different intensities in a training session, is a fundamental characteristic in physical training protocols with the objective of improving functional capacity for women. Postmenopausal women targeting multisystemic adaptations. However, the applied protocol does not alter the anthropometric indices.

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