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Effects of Walking Football on the physical health of men and women over 50 years old

Efeitos do *Walking Football* na saúde física de homens e mulheres acima de 50 anos

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ABSTRACT

Objective: This study investigated the effects of Walking Football practice on physical fitness and body mass index in individuals over 50 years old, considering possible influences of participants' gender and age. Methods: The participants had no previous experience with the sport. The training protocol lasted 16 weeks, with two weekly sessions of 120 minutes each, totaling 240 minutes per week, distributed across 32 sessions. Assessments were conducted at weeks 0, 8, and 16, using physical tests from the American Alliance for Health, Physical Education, Recreation and Dance protocol to evaluate coordination, flexibility, agility, strength, and endurance. Results: The 35 participants (11 men and 24 women, 67.7 ± 5.5 years old) showed significant improvements on the coordination ($p < 0.001$; $\eta^2 = 0.10$), agility ($p < 0.001$; $\eta^2 = 0.07$), flexibility ($p < 0.001$; $\eta^2 = 0.03$), and upper-limb strength tests ($p < 0.001$; $\eta^2 = 0.16$) at weeks 8 and 16 compared to baseline. Lower limb strength improved at week 8 but returned to baseline values at the end of the training. No significant changes were observed in endurance or in body mass index. Furthermore, performance changes were not influenced by participants' age or gender. Conclusion: The findings highlight that Walking Football, when practiced with a weekly volume of at least 120 minutes, can be an effective strategy for maintaining and enhancing physical fitness in individuals aged 50 years and older.

Keywords: Older adults; Aging; Sports; Health.

RESUMO

Objetivo: Este estudo investigou os efeitos da prática do Walking Football nas capacidades físicas e índice de massa corporal de pessoas com mais de 50 anos, considerando possíveis influências do gênero e da idade dos participantes. Métodos: Participaram desse estudo pessoas sem experiência prévia com a modalidade. O protocolo de treinamento teve duração de 16 semanas, com duas sessões semanais de 120 minutos cada, totalizando 240 minutos por semana, distribuídos em 32 sessões. As avaliações foram realizadas nas semanas 0, 8 e 16, utilizando testes físicos do protocolo American Alliance for Health, Physical Education, Recreation and Dance para avaliar a coordenação, flexibilidade, agilidade, força e resistência. Resultados: Os 35 participantes (11 homens e 24 mulheres, 67,7 ± 5,5 anos) mostraram melhoras significativas de desempenho nos testes de coordenação (p-valor < 0,001; η² = 0,10), agilidade (p-valor < 0,001; η² = 0,07), flexibilidade (p-valor < 0,001; η² = 0,03) e força de membros superiores (p-valor < 0,001; η² = 0,16) nas semanas 8 e 16 em relação ao início do treinamento. A força de membros inferiores melhorou na semana 8, mas retornou aos valores iniciais ao fim do treinamento. Não foram observadas mudanças significativas na resistência e no índice de massa corporal. As mudanças de desempenho não foram influenciadas pela idade ou gênero dos participantes. Conclusão: O Walking Football, quando praticado com um volume igual ou superior a 120 minutos semanais, pode ser uma estratégia eficaz para a manutenção e melhoria das capacidades físicas em pessoas com mais de 50 anos.

Palavras-chave: *Envelhecimento; Esportes; Saúde; Atividades físicas.*

Introduction

The Brazilian older population has been aging rapidly, nearly doubling between 2000 and 2023 – from 15.2 million to 33 million people[1]. Projections indicate that by 2041, this group will reach approximately 55 million individuals, representing 25.6% of the total population[1]. However, this increase in longevity has been accompanied by growing concerns about the health and well-being of older adults. One of the main challenges is the high prevalence of physical inactivity in this group. Studies conducted in Brazil show that although 55.3% of older adults report engaging in regular physical activity, only 27.5% reach the recommended levels of physical activity[2-4]. To address this issue, it is essential to control exercise intensity and reduce the risk of injuries through the safe practice of physical and sports activities. In this context, research emphasizes the importance of adapting sports to the needs of this age group, promoting continuity in practice and contributing to improved quality of life[5,6].

Among the alternatives explored to encourage sports participation among older adults, various forms of recreational football have been investigated. One example is football, which resembles traditional football but prohibits sliding tackles to reduce the risk of falls[7]. Studies indicate that, due to its high intensity, this form of play can improve functional capacity in older adults[8]. However, recreational football is predominantly practiced by men with previous experience in the sport and played under rules similar to conventional football. Individuals with limited football experience or mobility difficulties often face barriers to participation. In this context, Walking Football (WF) has emerged as a viable alternative, featuring modified rules that facilitate the inclusion of groups historically underrepresented in traditional football[9].

The main adaptations of WF include the prohibition of running, restrictions on aerial play, and limitations on direct physical contact. Additionally, field size and team composition can be adjusted to encourage participation. WF was first structured in England in 2011 and has since expanded to several countries through organizations responsible for its regulation[9]. In Brazil, the sport is developed by Walking Football Brasil, founded in 2018[10]. During its implementation, the organization aimed to promote social transformation and human development, establishing pillars of diversity and inclusion in sports for life. Unlike its consolidation in other countries, where competitiveness predominates, the Brazilian model focuses on participatory sport[10]. In this model, individuals of different genders and ages play together. While competition is present throughout the activity, cooperation and collaboration are emphasized.

Initial studies on the health benefits of WF for older adults showed that regular practice – one 60-minute session per week for eight weeks – was insufficient to produce significant changes in body composition, blood pressure, or cardiorespiratory fitness among male participants, although it achieved a high adherence rate (70%)[11]. These findings were corroborated by Reddy et al.[12], who examined a 12-week program with weekly 60-minute sessions and also found no significant improvements in health or cognition outcomes. The authors attributed these results to the low training volume and suggested that more than 60 minutes per week would be necessary to achieve measurable benefits.

Other studies have investigated WF programs with higher training volumes. Arnold, Bruce-Low, and Sammut[13] analyzed a 12-week intervention involving two-hour weekly sessions with ten men over 50 years old. The results indicated significant reductions in fat mass and body fat percentage, as well as an increase in time to exhaustion during an incremental exercise test. However, total body mass, lean mass, and body mass index (BMI) did not change significantly. Similarly, Duncan et al.[8] examined the effects of 12 weeks of WF, performed twice per week for 60 minutes per session, on body composition and physical fitness in 30 healthy men aged 60 to 80 years. The authors found no significant changes in body fat or handgrip strength compared with the control group. However, they observed notable improvements in endurance, agility, and speed tests among WF participants. These results suggest that WF, when practiced regularly for at least 120 minutes per week, could be incorporated into public health policies promoting the physical, mental, and social well-being of older adults[14].

The aforementioned studies demonstrate that WF has potential benefits for the physical health of older adults, especially when practiced at higher volumes. Nonetheless, important gaps remain in the literature. One such gap relates to the participant population, which typically consists of men with lifelong football experience[14]. Only one study involving women was identified, but it examined a low-volume program (80 minutes per week) and did not specifically analyze gender differences in training effects[15]. In strength training research, different adaptation patterns have been observed between men and women over 65 years of age[16,17], suggesting that WF training responses could also vary by gender. Similarly, studies on older adults have shown that individuals aged 70–75 tend to achieve greater performance gains from physical training compared with those over 75[18]. However, no studies have yet examined whether performance changes induced by WF practice are associated with age progression. Therefore, this study aimed to analyze the effects of WF practice over 16 weeks – two 120-minute sessions per week, totaling (totaling 240 minutes weekly and 32 sessions in total) on physical fitness and BMI in individuals aged 50 years and older, considering changes over time by age and gender.

Methods

This study was designed as a single-group experimental study in which all participants underwent the same intervention: 16 weeks of WF practice, with two 120-minute sessions per week. No control or comparison group was included. Additionally, the study did not employ blinding procedures or intention-to-treat analysis. Finally, it should be noted that the protocol was not preregistered in any public clinical trial databases.

Participants

Participants were recruited in person from the WF classes offered by Walking Football Brasil at the Jundiaí center in the state of São Paulo (Brazil). Inclusion criteria required individuals to be over 50 years old, medically cleared for regular physical activity, and with no previous experience in WF practice. All participants were informed about the study and signed an Informed Consent Form (CAAE: 72012223.7.0000.5404) prior to data collection. No a priori sample size calculation was performed.

The study was conducted during the first semester of 2024. The first contact with participants and formal invitations took place in February 2024. Baseline assessments and the implementation of the intervention began in March and continued through June, totaling approximately four months of continuous monitoring.

Physical Assessments

The activities were carried out at a municipal sports center to ensure standardized and controlled conditions for both training and physical assessments. The primary outcomes were defined as participants' physical fitness components, assessed using the test battery proposed by the American Alliance for Health, Physical Education, Recreation and Dance. In addition, BMI was measured as an indicator of body composition.

Assessments were conducted at three time points during the training period: baseline (week 0), midpoint (week 8), and post-intervention (week 16). Initially, participants underwent a familiarization phase during which researchers presented and demonstrated each test. All assessments followed the American Alliance for Health, Physical Education, Recreation and Dance protocol, which has been validated for use with the Brazilian older population.

For body composition evaluation, participants stood barefoot on a digital scale (Welmy™, São Paulo, Brazil) with 100 g precision. Height was measured using a wall-mounted stadiometer. Participants stood upright against the wall, and height was recorded at the point where the stadiometer touched the top of the head. BMI was calculated by dividing body mass (kg) by height squared (m^2).

The flexibility test was performed using a measuring tape and adhesive tape fixed perpendicularly to the floor. Participants sat barefoot with legs extended, feet apart, knees straight, and heels aligned with the markers. With one hand over the other, they were instructed to reach forward along the measuring tape as far as possible without bending the knees. Two attempts were recorded, and the best result was used for analysis.

Agility and strength tests were applied in random order. In the agility test, a chair was placed at the center, with two cones positioned diagonally (1.80 m to the side and 1.50 m behind the chair). Participants began seated, and at the evaluator's signal, stood up, circled the right cone, returned to sit, then repeated the movement for the left cone. The test ended when the participant sat down after the second circuit. Two trials were performed, and the shortest time (in seconds) was recorded.

For upper-limb strength, participants sat on a chair without armrests, keeping their backs against the backrest, torso upright, and feet flat on the floor. Holding a 1.814 kg dumbbell in the dominant hand, with the arm parallel to the floor, participants were instructed to perform as many elbow flexions as possible in 30 seconds.

For coordination, participants sat in front of a table and were asked to move three cans between pre-marked positions on adhesive tape fixed to the surface. Using the dominant hand, they alternated the cans between positions, turning each one upside down after every movement. The circuit consisted of two continuous cycles. The shortest recorded time (in tenths of a second) from two valid attempts was used as the final result.

Finally, endurance was assessed through an 804.67-meter walk test, during which participants were instructed to walk as fast as possible at a consistent pace. The total time to complete the distance was recorded in minutes and seconds.

Training Protocol

To assess participants' exercise readiness, the Physical Activity Readiness Questionnaire was administered. Participants were asked to maintain their usual physical activity habits during the study. The WF training program consisted of two 120-minute sessions per week for 16 weeks, totaling 240 minutes per week and 32 sessions overall. Sessions were led by a physical education professional and supported by two interns, following the principles and methodology of Walking Football Brasil.

Each session was divided into three stages: i) specific stretching and warm-up exercises; ii) activities focused on developing football-related skills; iii) formal WF match play. At the start of each session, blood pressure was measured using an HEM-6181, Omron™, Brazil, digital sphygmomanometer. Measurements were taken after five minutes of rest, with participants seated, in a calm environment, and with the arm positioned at heart level. Participation was deemed safe when readings were below 140/90 mmHg; when values ranged from 140–159/90–99 mmHg, activities were performed under monitoring; readings equal to or greater than 160/100 mmHg required suspension of participation for that day. During the stretching and warm-up phase, both static and dynamic exercises were performed individually or in pairs. Examples of static stretches for the lower limbs included forward trunk flexion, quadriceps stretching, and calf stretches. Dynamic exercises included paired leg swings (forward and lateral) and ball-handling movements such as torso rotations and flexion–extension drills.

The second stage, focused on game-specific activities, involved drills that combined skill development (passing, dribbling, receiving, and shooting) with decision-making in game contexts. These activities were organized in small groups with varying player numbers (e.g., 2x1, 2x2, 3x2, 3x3), using small-sided spaces to encourage frequent ball contact.

Finally, the third stage consisted of formal WF games. Teams were composed of an equal number of players, and goalkeepers were not included. Small cones were placed beneath the official goalposts to mark the scoring zones, and the goal area was restricted to all players. Consistent with WF rules, running, aerial plays, and physical contact were not allowed. Training sessions took place on an indoor court measuring 19 × 28 meters.

Statistical Analyses

Descriptive statistics were used to summarize and present the collected data. Normality of distribution and homogeneity of variances were verified using the Kolmogorov–Smirnov and Levene tests, respectively.

Comparisons between men and women at baseline were performed using the independent samples t-test for quantitative variables and the chi-square test for qualitative variables.

Changes in physical fitness across training weeks (0, 8, and 16) were analyzed using one-way repeated-measures ANOVA, followed by Tukey's post hoc tests. Effect size was calculated using partial eta squared (η^2), interpreted as follows: small (≥ 0.01), medium (≥ 0.06), and large (≥ 0.14) effects[20].

For each physical fitness variable, performance variation between time points (e.g., 0–8, 8–16, and 0–16 weeks) was calculated. Relationships between participants' age and performance changes were examined using Pearson's correlation coefficient, with 95% confidence intervals (CI). Correlations were classified as very weak (< 0.20), weak (0.20–0.39), moderate (0.40–0.59), strong (0.60–0.79), and very strong (≥ 0.80).

To compare physical fitness performance (dependent variable) across assessment moments (independent variable) and participant gender (independent variable), a two-way ANOVA was conducted. As significant gender differences were observed in baseline body mass, a repeated-measures ANCOVA was used for this variable. Partial eta squared (ηp^2) was used to assess effect size, following the same interpretative thresholds[20].

All analyses adopted a significance level of $p < 0.05$. Statistical analyses were performed using IBM SPSS Statistics for Windows, version 22.0 (IBM Corporation, USA).

Results

Figure 1 presents the participant recruitment flowchart. A total of 65 individuals aged over 50 years and without prior experience with WF were initially invited to participate – 22 men and 43 women. However, some participants did not complete all three scheduled assessment sessions, resulting in attrition throughout the process. Consequently, the final sample consisted of 35 participants, including 11 men and 24 women.

A total of 35 participants took part in this study, with a mean age of 67.7 (5.5) years, ranging from 53 to 78 years. Regarding age distribution, two participants (6%) were between 50 and 59 years old, 21 (60%) between 60 and 69 years old, and 12 (34%) between 70 and 79 years old. Baseline characteristics of participants are presented in Table 1. Nearly half of the sample (n = 14; 35%) had hypertension, and most reported regular use of medication (n = 30; 86%) for blood pressure or cholesterol. Among men, most (n = 8; 73%) reported walking weekly, with an average duration of 43 minutes per day. Similarly, most women (n = 20; 83%) reported

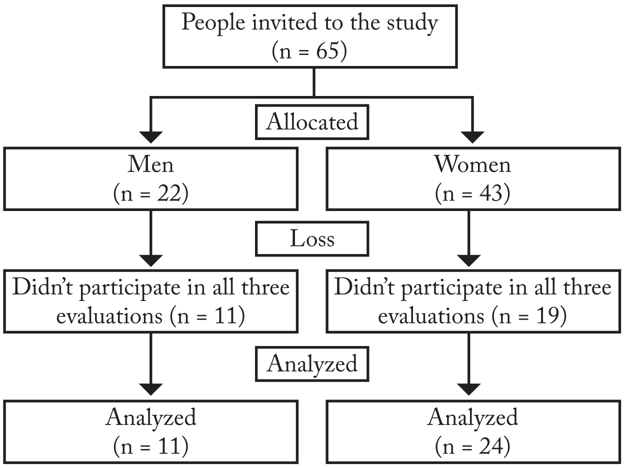

Figure 1 – Flowchart for recruiting study participants.

weekly walking practice averaging 66 minutes per day.

Figure 2 shows the performance of WF participants in different physical fitness components across 16 weeks of training. Significant improvements were observed in coordination ($F = 34.27$; $p < 0.001$), agility ($F = 23.01$; $p < 0.001$), flexibility ($F = 17.39$; $p < 0.001$), and upper-limb strength ($F = 22.12$; $p < 0.001$) at weeks 8 and 16 compared with baseline. No significant differences were found between weeks 8 and 16. Effect size analysis indicated small effects for flexibility ($\eta^2 = 0.03$) and medium effects for coordination ($\eta^2 = 0.10$), agility ($\eta^2 = 0.07$), and upper-limb strength ($\eta^2 = 0.16$). Lower-limb strength increased at week 8 but returned to baseline values at week 16 ($p < 0.001$). Endurance showed no significant changes across time points ($p = 0.489$).

Table 2 presents the correlations between participants' age and changes in physical performance over 16 weeks of WF training. No significant correlations were found between age and performance changes for most variables. Only improvements in flexibility showed a weak but significant correlation with age between weeks 0 and 8 ($r = 0.36$).

Table 3 displays the body mass, BMI, and physical performance results for men and women throughout the 16-week WF training program. Significant gender differences were found in BMI, flexibility, and lower-limb strength. However, no interaction effects were observed between gender and performance changes over time for any of the assessed variables. Only coordination and upper-limb strength showed significant time effects.

Table 1 – Baseline characteristics of the study participants

	Men (n = 11)	Women (n = 24)	Total (n = 35)	p-value
Age (years)	69.3 (4.7)	67.0 (5.9)	67.7 (5.6)	0.245
Body mass (kg)	80.1 (13.8)	60.7 (11.9)	67.0 (15.2)	<0.001
Body mass index (kg/m²)	27.8 (4.1)	25.2 (4.0)	26.0 (4.2)	0.093
Coordination (s)	14.1 (3.2)	13.1 (2.2)	13.4 (2.6)	0.378
Agility (s)	29.5 (7.7)	27.6 (4.0)	28.2 (5.4)	0.457
Flexibility (cm)	45.5 (9.6)	53.2 (12.9)	50.6 (12.3)	0.067
Upper-limb strength (reps)	17.2 (2.9)	17.1 (3.5)	17.1 (3.3)	0.925
Lower limb strength (reps)	13.4 (3.2)	14.6 (3.2)	14.2 (3.2)	0.340
Endurance (minutes)	9.0 (1.3)	9.1 (1.2)	9.1 (1.2)	0.803
Use of medication (n, %)	9 (82%)	21 (87%)	29 (83%)	0.999
Hypertension (n, %)	4 (36%)	10 (42%)	14 (40%)	0.999
Walking per week (days)	3.3 (2.9)	3.8 (2.7)	3.7 (2.7)	0.631
Walking per week (minutes/day)	43.0 (24.6)	66.7 (56.3)	48.0 (50.8)	0.105

Data presented as mean (standard deviation) or absolute (relative) frequency.

Table 2 – Correlation between the age of Walking Football practitioners and changes in physical performance over the 16 weeks of training.

Period	Coordination	Agility	Flexibility	Upper-limb strength	Lower limb strength	Endurance
0 to 8 wks	-0.13 (-0.44 a 0.21)	0.04 (-0.29 a 0.37)	-0.36 (-0.62 a -0.02)	0.13 (-0.21 a 0.44)	0.14 (-0.20 a 0.45)	0.07 (-0.30 a 0.42)
8 to 16 wks	0.19 (-0.16 a 0.49)	0.02 (-0.31 a 0.35)	0.09 (-0.25 a 0.41)	0.14 (-0.20 a 0.45)	-0.16 (-0.47 a 0.18)	-0.01 (-0.35 a 0.32)
0 to 16 wks	0.03 (-0.31 a 0.37)	0.12 (-0.22 a 0.45)	-0.11 (-0.43 a 0.24)	0.27 (-0.07 a 0.56)	-0.02 (-0.36 a 0.32)	-0.03 (-0.37 a 0.31)

Data presented as Pearson correlation coefficient (95% Confidence Interval).

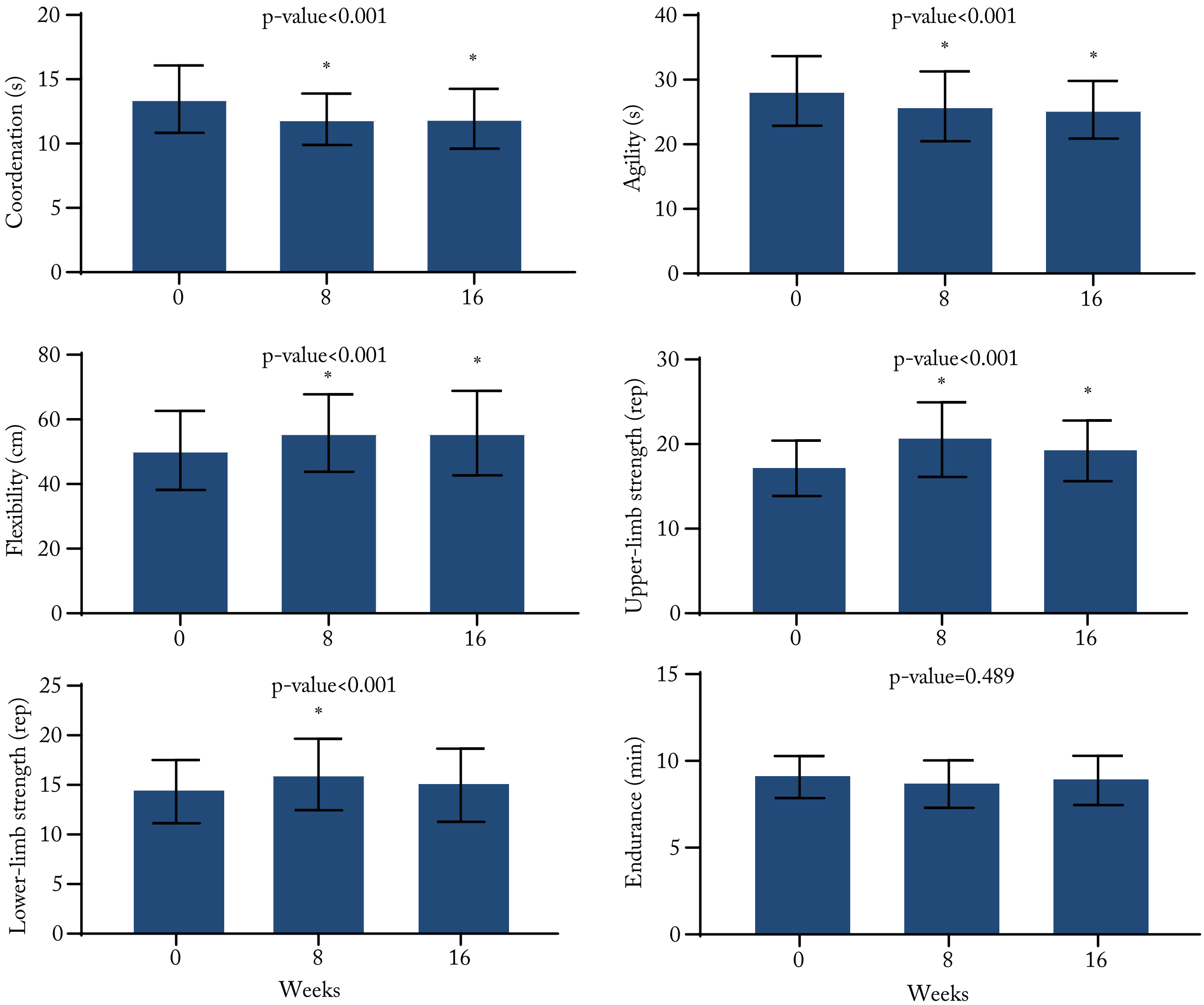

Figure 2 – Performance of Walking Football practitioners in different physical capacities assessed at three distinct time points.

Discussion

This study aimed to analyze the effects of WF practice on physical fitness and BMI in individuals aged over 50 years, considering training-induced changes according to participants' age and gender. The main findings revealed significant improvements in coordination, flexibility, agility, and upper-limb strength after eight and sixteen weeks of training. Lower-limb strength improved at week 8 but returned to baseline values at week 16. Endurance did not change significantly throughout the intervention. Finally, performance improvements were not influenced by participants' age or gender, except for a weak correlation between flexibility gains and age during the first eight weeks.

The effects of WF training on physical fitness and BMI observed in this study are consistent with previous research[8,13]. Improvements in coordination, flexibility, agility, and upper-limb strength have also been reported in studies involving weekly sessions totaling 120 minutes or more. However, similar to the present study, those investigations did not find significant changes in body composition throughout the intervention[8,13]. In our case, the absence of a control group represents an important limitation, as it makes it difficult to isolate the specific effects of physical activity practice on body composition. This may partly explain the lack of significant changes in anthropometric measures. Additionally, the absence of dietary control during the experimental period – given that diet directly influences these variables – should also be noted[21]. Nevertheless, the present findings, together with the existing scientific literature, highlight the potential of WF, when practiced regularly for at least 120 minutes per week, to promote physical health among indi-

Table 3 – Performance of men and women practicing Walking Football over 16 weeks of training.

Variable	Week	Men (n = 11)	Women (n = 24)	Anova Two-Way	F-value	p-value	ηp²
	0	80.1 (13.8)	60.7 (11.9)	Moment	1.840	0.164	0.04
Body mass (kg)	8	79.3 (13.3)	60.2 (11.8)	Gender	0.090	0.764	0.36
	16	79.4 (13.0)	60.3 (11.6)	Interaction	0.090	0.913	0.01
	0	27.8 (4.1)	25.2 (4.0)	Moment	0.050	0.951	0.01
Body Mass Index (kg/m²)	8	27.5 (4.4)	24.9 (4.2)	Gender	9.231	0.003	0.09
	16	27.7 (4.1)	25.0 (3.9)	Interaction	0.001	0.999	0.01
	0	14.1 (3.2)	13.1 (2.2)	Moment	4.678	0.012	0.09
Coordination(s)	8	12.6 (2.5)	11.5 (1.7)	Gender	3.271	0.074	0.03
	16	12.2 (2.9)	11.6 (2.1)	Interaction	0.148	0.862	0.01
	0	29.5 (7.7)	27.6 (4.0)	Moment	2.963	0.056	0.06
Agility (s)	8	27.8 (7.8)	24.9 (3.6)	Gender	2.519	0.111	0.03
	16	25.6 (4.1)	25.1 (4.1)	Interaction	0.362	0.698	0.01
	0	45.5 (9.6)	53.2 (12.9)	Moment	1.575	0.212	0.03
Flexibility (cm)	8	49.8 (10.0)	58.6 (12.0)	Gender	9.412	0.003	0.09
	16	50.5 (14.1)	58.1 (12.5)	Interaction	0.024	0.977	0.01
	0	17.2 (2.9)	17.1 (3.5)	Moment	5.109	0.008	0.10
Upper-limb strength (rep)	8	20.0 (5.0)	20.8 (4.1)	Gender	0.310	0.579	0.01
	16	18.6 (3.8)	19.3 (3.5)	Interaction	0.118	0.889	0.01
	0	13.4 (3.2)	14.6 (3.2)	Moment	1.453	0.239	0.03
Lower limb strength (rep)	8	14.0 (2.8)	17.0 (3.5)	Gender	7.779	0.006	0.07
	16	13.6 (3.1)	15.2 (3.9)	Interaction	0.575	0.565	0.01
	0	9.0 (1.3)	9.1 (1.2)	Moment	0.902	0.410	0.02
Endurance (min)	8	8.4 (1.3)	8.8 (1.4)	Gender	0.754	0.387	0.01
	16	8.7 (1.4)	8.9 (1.4)	Interaction	0.075	0.928	0.01

Data presented as average (standard deviation). Main effects: Time point – week zero, eight and 16; Gender – Male and female, ANCOVA – Used to analyze body mass.

viduals over 50 years old.

The absence of significant changes in lower-limb strength and endurance at the end of the WF training program was also reported by McEwan et al.[11] One possible explanation is that participants in this study already engaged in regular walking before joining the WF program, which may have led to preexisting adaptations in these physical fitness components. As a result, continuing a similar activity might not have provided sufficiently novel or intense stimuli to elicit additional gains. In contrast, the inclusion of exercises involving upper-limb movements, agility, and coordination may have been decisive for the observed improvements in these capacities. Since such components were likely underrepresented in participants' previous routines, their introduction into training may have provided a meaningful neuromuscular challenge, facilitating adaptation and improvement.

When analyzing the influence of gender and age on the adaptations promoted by WF training, no significant associations were identified. Only a weak correlation was found between flexibility improvements and participants' age from week 0 to week 8. This indicates that men and women, as well as individuals of different ages, responded similarly to the training stimulus. However, it was not possible to perform subgroup analyses by age range (e.g., 50–59, 60–69, 70+), as this would have resulted in reduced statistical power. This limitation makes it difficult to detect potential differences in training responses among age subgroups, which should be considered when interpreting the findings. Nonetheless, the results suggest that physiological responses to exercise are likely more influenced by prior conditioning level and training load than by demographic factors such as gender or age. Therefore, the present findings reinforce the notion that regular WF practice can benefit diverse population groups, provided that training programs are progressive and tailored to individual needs[22].

Beyond the physical benefits identified in this study, previous research has emphasized the positive social and psychological effects of regular WF participation, highlighting its potential to enhance not only physical health but also overall well-being. Studies conducted by Cholerton et al.[5,23,24] demonstrated that participation in group-based activities such as WF can strengthen community ties, foster a sense of belonging, and promote interpersonal interaction – all key factors for quality of life, particularly among populations at risk of social isolation. Group-based sports foster the development of interpersonal relationships and contribute to long-term exercise adherence, as social support is one of the primary motivational factors for consistent participation[25]. Furthermore, evidence suggests that sports and recreational activities involving social interaction can positively affect mental health by reducing stress, anxiety, and depression. Thus, WF, by combining physical exercise with social engagement, may play an important role in promoting holistic well-being, benefiting participants across multiple health dimensions.

The limitations of this study should be considered when interpreting the results. First, the lack of a control group restricts the ability to establish causal relationships between WF practice and the observed adaptations. Without a comparison group, it is not possible to rule out the influence of external factors such as spontaneous lifestyle changes or individual variation in training responses. Future studies should include control groups to strengthen internal validity and allow for a more accurate assessment of intervention effects. Another limitation concerns the absence of a priori sample size calculation, which prevents determining whether the number of participants was sufficient to detect statistically significant differences. Additionally, no control over participants' dietary intake was implemented during the study period. Nutrition plays a fundamental role in physiological and metabolic adaptations to exercise, influencing variables such as body composition, energy metabolism, and physical performance[26]. It was also not possible to conduct analyses stratified by age groups, as subgroup sizes would have been too small. Future research with larger samples could address this limitation by analyzing distinct age intervals (e.g., 50–59, 60–69, and 70+), enabling more precise interpretations and improving applicability to real-world interventions and public policies promoting active aging. Despite these limitations, the current findings contribute valuable insights into the benefits of WF and provide a foundation for future research aimed at refining methodological design and expanding knowledge about this sport.

The results of this study demonstrate that regular WF practice led to significant improvements – after eight weeks of training – in coordination, agility, flexibility, and upper-limb strength among individuals over 50 years old, regardless of gender or age. However, no changes were observed in endurance or BMI, possibly due to participants' previous activity levels and the absence of dietary control. Performance changes were not influenced by age or gender. These findings reinforce WF as a feasible and accessible alternative for promoting health and active aging, aligning with current physical activity recommendations for this population.

Conflict of Interest

The authors declare that there are no conflicts of interest.

Author Contributions

Barreira J: Conceptualization; Data analysis; Data presentation design; Writing – review and ediing; Approval of the final version of the manuscript. Saia ME: Conceptualization; Methodology; Original draft preparation; Writing – review and editing; Approval of the final version of the manuscript. Batista ABCV: Methodology; Original draft preparation; Writing – review and editing; Approval of the final version of the manuscript. Souza D: Methodology; Data validation and experiments; Resources; Data curation; Writing – review and editing; Approval of the final version of the manuscript. Castro D: Resources; Data curation; Supervision; Project administration; Writing – review and editing; Approval of the final version of the manuscript. Cunha AA and Oliveira JPS: Data validation and experiments; Resources; Data curation; Writing – review and editing; Approval of the final version of the manuscript. Leme R: Resources; Data curation; Supervision; Project admin-istration; Writing – review

Declaration on the Use of Artificial Intelligence Tools in the Writing Process

The authors declare that Generative AI was used in the creation of this manuscript. The authors used ChatGPT (OpenAI) to assist with the English language editing of this manuscript. All content was subsequently reviewed and validated by the authors.

Data Availability Statement

Upon publication, data will be made available upon reasonable request to the authors, as justified in the manuscript.

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