

THE IMPACT OF RECREATIONAL FOOTBALL ON BODY COMPOSITION, FUNCTIONAL AND MOTOR ABILITIES - SYSTEMATIC REVIEW

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REVIEW ARTICLE

DOI: 10.5937/ATAVPA25051F

Abstract: *Recreational football is a versatile and intense form of physical activity that can be considered an excellent alternative to traditional continuous exercise forms such as running, cycling, and swimming. This type of exercise offers numerous health benefits, including improvements in body composition, functional abilities, and motor skills. The aim of this paper is to provide a systematic review of existing research on the impact of recreational football on body composition, functional, and motor abilities. By analyzing data from relevant scientific databases such as Google Scholar, SCOPUS, and the Serbian Citation Index, studies examining the effects of recreational football in different populations, including children, adults, and the elderly, were included. The results of numerous studies indicate that recreational football can lead to a reduction in body fat, an increase in muscle mass, and improvements in cardiorespiratory endurance. Additionally, this form of physical activity contributes to enhanced coordination, speed, agility, and explosive power. The conclusion of this research is that recreational football is a highly effective form of physical activity that can contribute to the improvement of health and physical abilities, regardless of age, gender, or fitness level. Its diversity makes it an attractive type of training that not only enhances physical parameters but also encourages social interaction and the long-term adoption of an active lifestyle.*

Key words: *football, recreation, motor abilities, functional abilities, body composition.*

INTRODUCTION

Structurally, football is a highly complex and intricate game. It belongs to the group of polystructural acyclic movements with a high level of complexity. It is a sport characterized by numerous complex movements, including both acyclic and cyclic movements of high volume and intensity. Since its inception, football has continuously evolved, both as a whole and in the transformation of individuals as integral and indivisible elements of the game (Joksimović, 2002). The current level of football development is marked by great dynamism and a high pace of play, which require players to have exceptional physical conditioning, a high level of movement technique, tactical maturity, and psychological stability. Alongside the development of football, the importance of conditioning training has increased, particularly concerning the pace, speed, and dynamism of the game, as well as its technical and tactical demands. Physical preparation in modern football is highly emphasized, especially at elite competitive levels. However, physical conditioning must always be considered within the context of football and not as a separate goal.

Recreational football is one of the most popular sports in the world, with over 200 million active participants. Therefore, it should be utilized to promote sports participation on a global scale, as a lack of time and motivation are key factors contributing to physical inactivity. As such, it fosters socialization and provides a motivational boost to participants (Elbe et al., 2010).

Recreational football serves as a suitable alternative to continuous exercises such as running, cycling, swimming, or other activities that improve the cardiorespiratory system (Castagna et al., 2007). In untrained men, it significantly improves maximal aerobic power, blood pressure, muscle capillarization, and intermittent exercise performance. These effects are similar to interval training and more pronounced than those of continuous moderate-intensity running and strength training. It effectively stimulates musculoskeletal, metabolic, and cardiovascular adaptations important for health, thereby reducing the risk of diseases associated with modern lifestyles (Krustrup et al., 2010). The structure of recreational football promotes socialization, and the nature of the game itself is motivating for participants. This form of training can help individuals stay motivated, persist in exercise, and improve their health (Elbe, Strahler, Krustrup, Wikman, & Stelter, 2010). This type of exercise is intense and versatile, involving multiple actions and significant, unexpected impacts. It is assumed that recreational

football is beneficial for bone health maintenance and modeling (Milanović et al., 2022). The primary goal of every football training session must be to enhance players' performance capacity. If a match is the best form of training, then conversely, a good training session should have the characteristics of a match (Joksimović, 2002).

Body composition and nutritional status are crucial factors for an athlete's health and performance. Body composition refers to the structure of the organism, represented by the grouping of measurable segments that make it up. While not every characteristic of body composition is expected to play a role in optimal professional and recreational football performance, lower levels of body fat and higher muscle mass are desirable for optimal sports results (Rienzi et al., 2000; Gil et al., 2007). It is known that morphological characteristics are determined by endogenous factors, while exogenous factors play a significant role in the expression of genetically defined ranges. It is important to note that physical activity is the most effective and popular external factor for inducing morphological adaptations in the body. In this context, the proper and adequate application of training, as well as the formation of recreational and sports training habits, is of great significance (Malacko et al., 2015).

RESEARCH METHOD

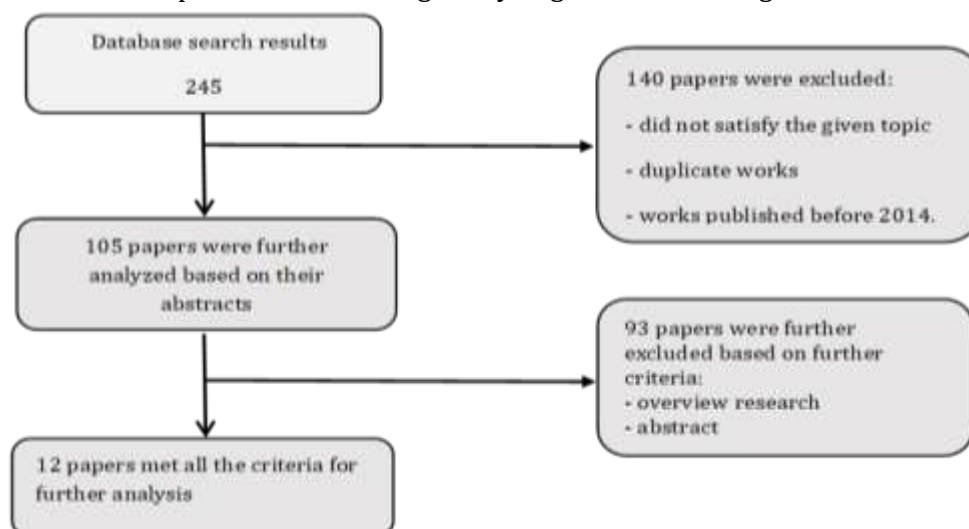
The following databases were used for literature collection: Google Scholar, PubMed, SCI Index, ResearchGate, as well as other relevant literature that could address the research question. The keywords used during the search included: football, recreation, motor skills, functional abilities, body composition, recreational football, amateur soccer, body composition, fat percentage, muscle mass, functional abilities, cardiorespiratory fitness, VO2 max, and motor skills.

The research focused on studies published between 2014 and 2024. The selected studies were read and analyzed. To be included in the final analysis, they had to meet three criteria: they had to be experimental in nature, related to recreational football, and published between 2014 and 2024. A descriptive method was used for collecting and reviewing previous research, in parallel with theoretical analysis.

Procedure

The selection of studies was based on titles and keywords. Three criteria were applied for selection. The first criterion focused on the research topic, specifically examining the impact of recreational football on body composition, functional abilities, and motor skills. The second criterion required that the studies be experimental in nature. The third criterion was that the studies had to be published between 2014 and 2024. Within the specified time frame, twelve studies closely related to the research topic met the criteria for further consideration.

Figure 1 illustrates the process of collecting, analyzing, and eliminating identified scientific studies.



RESULTS

Table 1 Overview of collected research and basic characteristics of the experimental treatment

Study	Exercise Program & Intensity	Tests and tested parameters	Sample of participants	Results
Andersen et al. (2014)	FG-16 weeks of recreational football (1.6x per week) + CG-strength training (1.5x per week)	YYIE1, VO ₂ max, TTE HRwlk, HRrun, La ⁻ , STS	63-74 years (68.2±3.2) n=26 M	FG significantly improved VO ₂ max and endurance during intense efforts. Recreational soccer may be an effective alternative to strength training for improving aerobic endurance, functional strength, and cardiovascular efficiency in older adults.
Nielsen (2014)	12 months football vs. 6 months football vs. 3 months spinning/CrossFit	Interviews, thematic analysis, SDT, ATLAS.ti software	39-71 years, n=28, M	FG: 80%–89% continued playing soccer after the program. Spinning/CrossFit: Only 15% kept training. Team sports like soccer better sustain long-term activity in older men.
Randers et al. (2014)	FG-12 weeks of football fitness training (3x per week)	InBody 270, YYIE1, SSBT, 20-m sprint test, WHOQOL-BREF, WEMWBS	60+ years n=66, M/W	Improved postural balance, aerobic endurance, quality of life and mental well-being. There were no significant changes in body composition or sprint performance.
Schmidt et al. (2014)	FG-12 months (2x per week first 4 months, after that 3x) of small-sided football (3v3, 4v4, 5v5) vs SG, CG	Echocardiography, VO ₂ max, BP, lipid profile	65-75 years (68.2±3.2) n=26, M	Soccer training had superior effects to strength training in older inactive men. Improvements included cardiac structure, functional parameters, and aerobic capacity.
Milanović (2015)	FG-12 weeks of recreational football (5v5, 3x per week) vs RG, CG	Tanita BC-418 analyzer, Kistler Quattro Jump platform, COSMED Quark b2 spiroergometer, Technogym RUNRACE tape, flexibility	20-40 years n=64, M	The results show statistically significant differences in the values of VO ₂ max, half-squat jump, and flexibility. Recreational soccer and continuous running improved cardiovascular fitness and body composition, but only soccer training significantly improved muscular fitness and flexibility.
Milanović et al. (2015)	FG-12 weeks of recreational football (3x per week, 5v5/6v6/7v7), vs RG, CG	BMI, VO ₂ max, Hrmax (Polar Team System), CMJ, SJ, SRT	20-40 years n=69, M	Recreational soccer and moderate-intensity continuous running improve aerobic capacity and reduce body mass in untrained men. Soccer training significantly improved explosive power and flexibility.
Cvetković (2018)	FG-12 weeks of football (3x per week) vs. HIIT training	InBody 720, CMJ, SRT, YYIE1, Polar Team System H7, BP	11-13 years n=42, M	The results showed that FG and HIITG recorded significant improvements in reducing body fat, increasing VO ₂ max, as well as improving muscle strength and endurance, and lower extremity explosive power. FG showed superior results. CG recorded an increase in body mass, BMI and body fat percentage.

Duncan et al. (2022)	FG-12 weeks of recreational football (2x per week) vs CG	Rikli and Jones Senior Fitness test, BMI, BI, RD	61-80 years (66±4) n=26, M	A 12-week recreational soccer program significantly improved: - Lower body strength - Agility and balance - Aerobic endurance
Modena et al. (2023)	Two studies: Interrupted Time-Series Design, Randomized Parallel Trial -12 weeks of small football 5v5 or 6v6; FGLow- 1x a week; FGmod-2x per week	BMI, BI, BP, VO ₂ max, lipidni profil (analiza krvi)	30-55 years n=52, M	Study 1: One football training session per week led to improvements in LDL cholesterol and VO ₂ max, while two training sessions per week further improved body mass, BMI and lipid profile. Study 2: Both groups improved VO ₂ max and lipid profile. No statistically significant difference was found between them, indicating that football training once a week has positive effects on cardiovascular health in inactive men.
Xu et al. (2024)	FG-16 weeks of small-sided football (5x per week, 3v3, 4v4), vs CG	SDM, VS, SRT, AT, BMI, BI, RD	18-25 years n=60, M/W	A 16-week recreational indoor soccer program produced the following results: Reduction in body fat, BMI, waist and hip circumference; Increase in muscle mass; Improving aerobic endurance; Greater explosive power of the lower extremities.
Skoradal et al. (2024)	FG-12 weeks of football (3x per week), vs CG	WHOQOL-BREF, WEMWBS, Flow Kurz Scale YYIE1, BMI, Polar Teampro, InBody 270, BP, The Standing Stork Balance Test, 20m sprint.	60+ years n=66, M/W	Football has improved the quality of life of the elderly, especially in the domain of perception of the environment (safety, availability of content, opportunities for socialization). There are also significant changes in postural balance, VO ₂ max, The control group showed improvement on the YYIE1 test.
Boithias et al. (2024)	FG- 6 weeks of football (2x per week)	Senior Fitness Test Manual, BMI, 2.5 Up and Go Test, Chair SRT, 6 Minute Walking Test, WHOQOL-BREF, EMAPS, BPNSF	60+ years n=15, M/W	Significant reduction in body weight and BMI. Increased satisfaction with competence and autonomy, reduced frustration of those needs. No significant changes in physical fitness were noted except for body mass and BMI.

M – Men; W – Women; n = Number of participants; FG – Football Group; CG – Control Group; RG – Running Group; SG- Strenght training Group; BMI – Body Mass Index; SRT – Shuttle Run Test; SDM – Standing Long Jump; VJ – Vertical Jump; AT – Anthropometric Measurements; BI – Bioelectrical Impedance; HD – Hand Dynamometer; VO₂max – Maximal Aerobic Capacity (Maximum Oxygen Consumption); SJ – Squat Jump; CMJ – Countermovement Jump with Arm Swing; BP – Blood Pressure; TTE – Time to Exhaustion on a Bicycle; YYIE1 – Yo-Yo Intermittent Endurance Test Level 1; HRmax – Maximum Heart Rate; HRwalk – Heart Rate during Walking; Hrrun – Heart Rate during Running; La⁻ – Blood Lactate Concentration; STS – Sit-to-Stand Test; WEMWBS – Warwick-Edinburgh Mental Wellbeing Scale; EMAPS – The Motivation for Physical Activity for Health Purposes Scale; BPNSF – Basic Psychological Need Satisfaction and Frustration; SDT - Self-determination theory; SSBT - Standing Stork Balance Test; SRT - Sit-and-Reach Test

DISCUSSION

The aim of this study was to determine the impact of recreational football on body composition, functional, and motor abilities based on existing literature. The research included 12 original scientific papers that were thoroughly analyzed.

The results of this study confirm that recreational football has a significant impact on improving body composition, functional, and motor abilities in various populations. Several studies included in the

analysis showed that regular participation in recreational football can lead to a reduction in body fat, an increase in muscle mass, and improvements in cardiovascular endurance (Milanović et al., 2015; Xu et al., 2024). It is particularly important that recreational football offers benefits in terms of explosive strength and agility, which are key factors for improving overall physical fitness.

Studies comparing football training with continuous aerobic exercise showed that the football group had superior results in improving flexibility and lower limb strength (Milanović et al., 2015; Cvetković, 2018). These results suggest that recreational football can be an effective training method for increasing functional capacity and reducing the risk of injury. Similarly, Duncan et al. (2022) demonstrated that a 12-week recreational football program in older adults improved lower body strength, agility, and aerobic endurance. Regarding the older population, studies have shown that recreational football significantly contributes to the improvement of postural balance, cardiovascular efficiency, and quality of life (Randers et al., 2014; Skoradal et al., 2024).

Andersen et al. (2014) showed that recreational football could be an effective alternative to strength training for improving aerobic endurance and functional strength in older adults. These findings are particularly important as they suggest that football training not only helps maintain physical activity in older adults but also improves their mental well-being, which is crucial for long-term health preservation. Moreover, the aspect of socialization should not be overlooked. Socialization plays a key role in maintaining motivation for physical activity. Research shows that team sports, such as recreational football, encourage long-term commitment to exercise more than individual training (Nielsen, 2014). Participants in football groups showed a higher degree of perseverance in physical activity compared to those engaged in spinning and CrossFit, confirming the importance of collective spirit in maintaining motivation.

Schmidt et al. (2014) demonstrated that football training has superior effects compared to strength training in older adults, improving heart structure and aerobic capacity. On the other hand, Milanović's (2015) research indicated that football training is more effective in improving muscular fitness and flexibility compared to continuous running. Modena et al. (2023) investigated the effects of different frequencies of football training and concluded that even one training session per week can improve VO₂max and lipid profile, while two sessions per week further improve body composition and BMI. These results suggest that even minimal involvement in recreational football can have significant health benefits.

Xu et al. (2024) showed that a 16-week small-sided football program significantly improved body composition by reducing body fat and increasing muscle mass in young adults. Skoradal et al. (2024) highlighted that football improves the quality of life in older adults, particularly in terms of socialization and environmental perception.

Boithias et al. (2024) analyzed the short-term effects of recreational football in older adults and found significant reductions in body weight and BMI, along with increased satisfaction with competence and autonomy, but no significant changes in physical fitness.

Considering the results of all the analyzed studies, it can be concluded that recreational football represents an effective form of physical activity that improves body composition, motor, and functional abilities while also positively impacting mental health and socialization. Future research should focus on the long-term effects of football training and potential strategies to optimize its benefits across different populations.

CONCLUSION

Based on the results of the research, it can be concluded that recreational football represents an extremely effective form of physical activity with numerous health benefits. This activity contributes to the reduction of body fat, an increase in muscle mass, and improvement in cardiovascular endurance, making it an attractive alternative to traditional forms of training. In addition to the physical benefits, recreational football improves motor skills, such as agility, explosive strength, and balance, and is especially beneficial for older adults as it positively affects their functional capacity and quality of life.

Besides the physiological advantages, an important aspect of recreational football is socialization, which plays a key role in long-term motivation for physical activity. Studies have shown that participants

in team sports, such as football, are more likely to remain committed to exercise compared to those who practice individual forms of training. This social element contributes to mental well-being and a sense of belonging, further enhancing the effectiveness of football training.

The conclusion of this research is that recreational football can significantly contribute to improving health and physical abilities, regardless of age and fitness level. Its versatility and accessibility make it an ideal choice for those who want to adopt an active and healthy lifestyle. Future research should focus on the long-term effects of football training and strategies for its broader application across the population.

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UTICAJ REKREATIVNOG FUDBALA NA TELESNI SASTAV, FUNKCIONALNE I MOTORIČKE SPOSOBNOSTI – SISTEMATSKO PREGLEDNO ISTRAŽIVANJE

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Sažetak: *Rekreativni fudbal predstavlja svestran i intenzivan oblik fizičke aktivnosti koji se može smatrati odličnom alternativom tradicionalnim oblicima kontinuiranog vežbanja kao što su trčanje, vožnja bicikla i plivanje. Ovaj oblik vežbanja nudi brojne zdravstvene koristi, uključujući poboljšanje telesnog sastava, funkcionalnih sposobnosti i motoričkih vještina. Cilj ovog rada je da pruži sistematski pregled postojećih istraživanja o uticaju rekreativnog fudbala na telesni sastav, funkcionalne i motoričke sposobnosti. Analizom podataka iz relevantnih naučnih baza kao što su Google Scholar, SCOPUS i Srpski citatni indeks, obuhvaćeni su radovi koji su ispitivali efekte rekreativnog fudbala u različitim populacijama, uključujući decu, odrasle i starije osobe. Rezultati brojnih studija ukazuju da rekreativni fudbal može dovesti do smanjenja telesne masti, povećanja mišićne mase i unapređenja kardiorespiratorne izdržljivosti. Pored toga, ovaj vid fizičke aktivnosti doprinosi poboljšanju koordinacije, brzine, agilnosti i eksplozivne snage. Zaključak ovog istraživanja je da rekreativni fudbal predstavlja visoko efikasan oblik fizičke aktivnosti koji može doprineti unapređenju zdravlja i fizičkih sposobnosti, nezavisno od uzrasta, pola i nivoa fizičke pripremljenosti. Njegova raznovrsnost čini ga atraktivnim vidom treninga koji ne samo da poboljšava fizičke parametre, već i podstiče društvenu interakciju i dugoročno usvajanje aktivnog načina života.*

Ključne reči: *fudbal, rekreacija, motoričke sposobnosti, funkcionalne sposobnosti, telesni sastav.*