



The Impact Of The Football Program On Children's Motor Skills

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Abstract

Fundamental motor skills (FMS) constitute the foundation for the development of more complex motor abilities in children and represent a key predictor of physical and cognitive health. The aim of this study was to analyze the effects of a football training program on the development of motor abilities in preschool and primary school-aged children. Methodologically, a systematic review of the literature was conducted using the PubMed, Scopus, and Google Scholar databases, applying the following search terms: “football training,” “children,” “motor skills,” “physical fitness,” and “intervention program.” After the selection process, ten studies met the inclusion criteria. The results indicate that football training programs integrating locomotor, manipulative, and coordinative skills significantly improve running performance, agility, balance, explosive strength, movement precision, and fine motor skills. Programs incorporating additional components, such as dynamic core exercises, demonstrate even greater effects on motor and functional fitness. In addition to motor benefits, football programs positively influence children’s cognitive development, including executive functions, attention, working memory, and decision-making speed. A comparative analysis of the reviewed studies suggests that training duration, frequency, and structure directly affect the magnitude and persistence of the observed improvements. Recreational football training and motor games programs further contribute to overall physical fitness, cardiorespiratory endurance, and children’s motivation for physical activity. Based on existing evidence, it is evident that well-structured football programs represent an effective strategy for enhancing motor and cognitive abilities, self-confidence, and a healthy lifestyle in children. Continuous inclusion of such programs in school and sports settings from an early age is therefore recommended to ensure optimal motor stimulation and development.

Keywords: football training, children, motor skills, physical fitness, intervention program.

INTRODUCTION

Fundamental motor skills (FMS) represent basic patterns of human movement and a key component of children's motor abilities (Ramachandran, 2012). They include locomotor skills such as walking, running, and jumping; manipulative skills involving catching, throwing, and kicking; and stabilizing skills such as rotation, bending, and balance control (Barnett et al., 2016). Well-developed FMS form the foundation for acquiring more complex motor structures required for successful participation in sports, games, and recreational activities (He et al., 2021). Childhood is a critical period for motor development, as the quality of gross and fine motor skill acquisition influences later movement competence and overall health (Clark et al., 2002; Barnett et al., 2009). Insufficient stimulation during this stage increases the risk of physical and mental health problems (Barnett et al., 2016). Contemporary lifestyles, characterized by reduced physical activity and increased sedentary behavior, further threaten the development of FMS in children (Gray et al., 2015; Hardy et al., 2013). Systematically designed physical activity programs can effectively enhance motor abilities and levels of physical fitness (Chen et al., 2018). There is a strong association between regular physical activity and the development of FMS, suggesting that higher activity levels contribute to improved motor development (Fisher et al., 2005; Kambas et al., 2012). Football, as a sport involving diverse movements, complex tasks, and frequent changes in direction and speed, demonstrates considerable potential for the development of locomotor and manipulative skills (Nazario et al., 2014). The effects of football training may vary depending on program duration, training methods, and participant characteristics, particularly in the domains of balance and movement precision (Ørntoft et al., 2016; Larsen et al., 2018). Motor development is closely linked to cognitive functions, including executive functions, working memory, and decision-making abilities (Chomitz et al., 2009; Haapala, 2013; Alesi et al., 2014). Regular physical activity stimulates prefrontal cortical regions, contributing to improvements in the speed and accuracy of information processing in children (Best, 2010). Motor skill is defined as a learned sequence of movements that enables the efficient execution of goal-directed activities (Farhat et al., 2015). Successful motor development requires extensive motor experiences and the enhancement of coordination (Stratton et al., 2004; von Hofsten, 2004; Libertus et al., 2013). Gross motor movements engage large muscle groups and develop early, whereas fine motor skills require precise movements of smaller muscle groups and are technically more demanding. Motor planning enables the brain to organize new and unfamiliar movement sequences. Complex motor tasks, particularly those involving coordination exercises, exert a stronger influence on cognitive functions than simple activities (Planinšec et al., 2006). Coordination activates the cerebellum, thereby enhancing working memory, attention, and information-processing speed (Budde et al., 2008). Football enables children to organize and integrate information during play, fostering formal thinking and tactical-cognitive abilities (Vestberg et al., 2012; Kun et al., 2012). Children who participate in football training develop rapid reactions, situational assessment, and decision-making skills by utilizing motor, perceptual, and cognitive capacities (Jansen et al., 2012). As early as nine years of age, football training contributes to shorter reaction times and more efficient decision-making compared with inactive peers (Chang et al., 2013). Previous research has primarily focused on preschool children or broad age groups, while systematic analyses of the effects of different football programs on the development of FMS across children of varying ages and sexes remain limited (Wick et al., 2017; Collins et al., 2019; Pardos-Mainer et al., 2021). These findings underscore the need for continuous programs that integrate motor and cognitive development. Properly structured football training facilitates the development of coordination, balance, precision, and reaction speed while simultaneously strengthening cognitive functions. Well-developed FMS constitute the basis for later success in sports, academic activities, and everyday life. Continuous stimulation of motor abilities contributes to healthy child development and the adoption of a healthier lifestyle. The aim of this study is to analyze the effects of a football training program on children's motor abilities.

METHOD

This study represents a review of the available scientific literature aimed at examining the effects of football training programs on the development of motor abilities in children. A systematic search was conducted across the electronic databases pubmed, scopus, and google scholar using combinations of the following terms: “football training,” “children,” “motor skills,” “physical fitness,” and “intervention program.” Initially, 123 publications were identified. After removing duplicates and excluding studies that were not relevant to the defined research question, a detailed screening process resulted in the selection of ten studies that met all inclusion criteria. The study selection process is presented using a flow diagram (Figure 1).

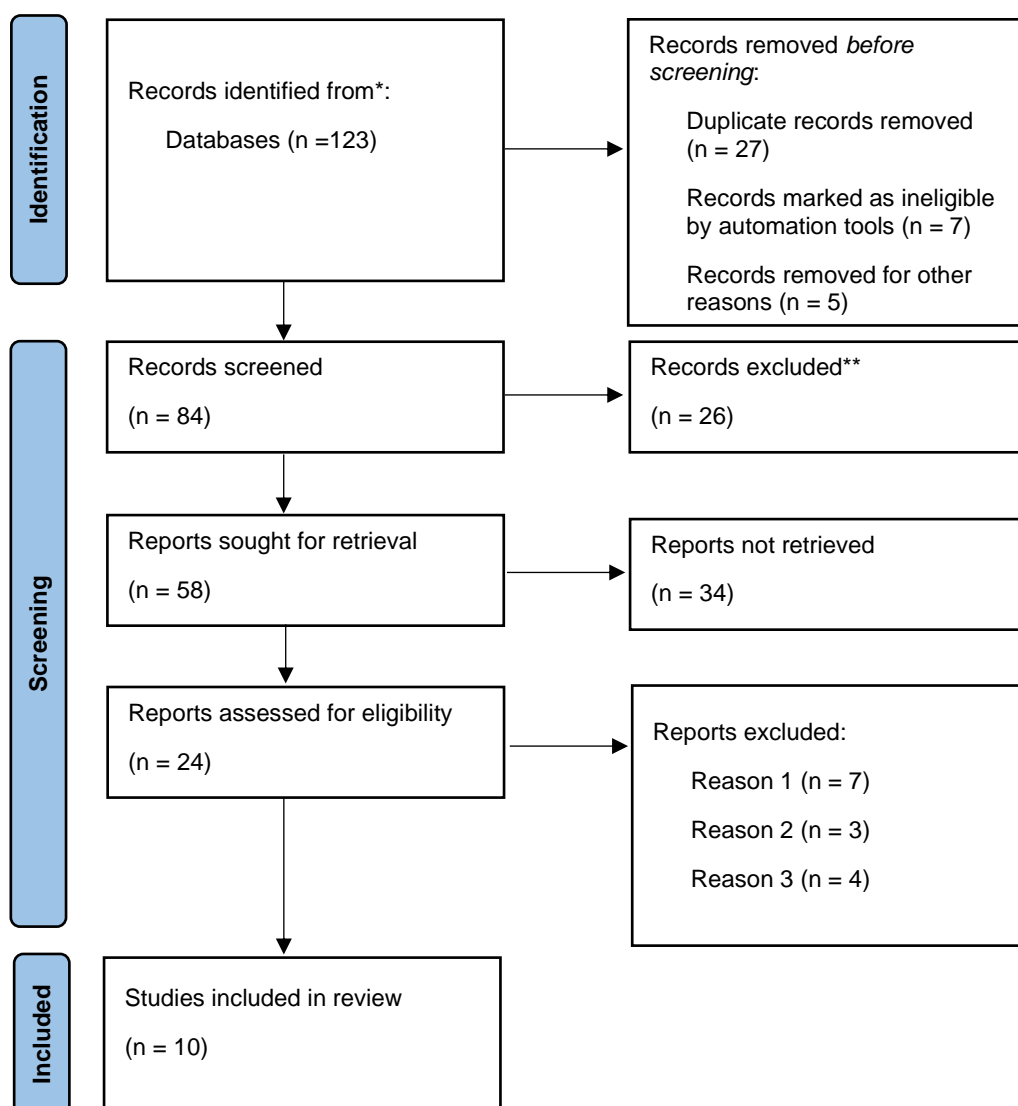


Figure 1. Prisma flow diagram, process for collecting studies for systematic review (Page et al. 2020)

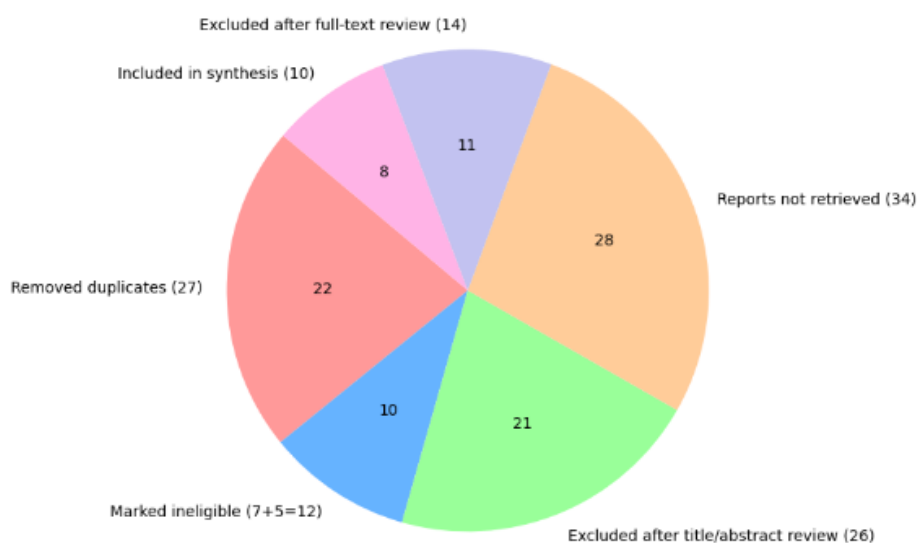
Inclusion Criteria:

- studies published in peer-reviewed scientific journals;
- studies involving preschool and early primary school-aged children;
- studies examining the effects of football (or similar sport-based) programs on motor abilities;

- studies employing clearly defined training protocols (duration, frequency, and training content);
- studies applying valid and standardized methods for assessing motor abilities.

Exclusion Criteria:

- duplicate records identified across multiple databases;
- studies published in languages other than English or not available in translation;
- studies involving only older children, adolescents, or adults;
- studies addressing general physical activity or sport without a specific focus on football training;
- studies with insufficiently defined motor ability assessment methods or lacking quantitative data.



RESULTS

Table 1 presents an overview of the included studies that examined the effects of football training programs on the motor abilities of preschool and primary school-aged children. The table summarizes the study samples, assessed variables, characteristics of the training programs, and the key outcomes of the observed transformations.

Table 1. Presentation of works used in the research

Author	Sample	Age	Type of intervention / program	Research result
Alesi et al., 2015	46 djece (EG = 24, CG = 22)	9.10 years	Football Exercise Program, 6 months; EG participated in football training, CG remained sedentary.	The EG showed improvements in running performance, coordination, lower-limb explosive strength, and shorter visual discrimination time compared with the CG; the program enhanced both motor and cognitive abilities.
Howells et al., 2022	5 children (EG = 16, CG = 19)	5–12 years	Community-based Football Program, variable duration; EG participated in a football	The EG demonstrated significant improvements in total MABC-2 score, aiming and catching, and balance; no changes were observed in manual dexterity; improvements in aiming and

			program, CG received treatment as usual.	catching were significantly greater than in the CG.
Aksoy et al., 2020	60 children (EG = 30, CG = 30)	11–13 years	Football Training Program, 8 weeks, 3 sessions/week, 50–60 min; EG trained football, CG had no exercise.	The EG showed improvements in body mass, BMI, flexibility, handgrip strength, balance, fine motor skills, 30 m sprint performance, and aerobic capacity.
Alesi et al., 2016	44 children (EG = 24, CG = 20)	8.8 years	Football Exercise Program, 6 months; EG trained football, CG remained sedentary.	The EG demonstrated significant improvements in coordinative skills (agility) and executive functions (working memory, attention, planning, and inhibition) compared with the CG.
Chikha et al., 2021	33 children (EG = 16, CG = 17)	11–12 years	Football play-based program, 10 weeks, 3 sessions/week; EG participated in play-based football activities, CG followed a standard program.	The EG showed significantly greater improvements in agility, visuospatial memory, mental flexibility, and inhibition; a significant correlation was found between mental flexibility and agility.
Mujezinović et al., 2022	60 children (EG = 30, CG = 30)	11–12 year	Programmed Football Training, 3 months, 38 training sessions; EG followed the program, CG performed standard activities.	The EG showed significant improvements in 11 of 16 assessed basic motor ability variables; the CG showed significant improvements in 6 variables.
Faude et al., 2010	22 children (EG = 11, CG = 11)	10.8 ± 1.2 years	Football Training Program vs. standard exercise program, 6 months, 3 sessions/week; EG football, CG standard sports program.	Both groups showed significant improvements in maximal performance, reduced submaximal heart rate, improvements in several motor abilities, and self-confidence; body composition and other psychometric variables remained largely unchanged; no significant differences were observed between programs.
Başkaya et al., 2023	60 children (EG dynamic = 20,	10–12 years	Dynamic and Static Core Training Program, 10 weeks, 3 sessions/week in addition to regular football; CG regular football only.	The dynamic core group showed significant improvements in all motor ability parameters and football skills; the static group improved in some parameters; the CG showed the fewest changes; the dynamic core group achieved significantly better results than the other groups.
Cuadro et al., 2021	25 children	8–10 years	Motor games program focusing on walking, running, kicking, jumping, and throwing,	The program significantly improved all assessed aspects of gross motor skills and movement patterns; improvements

		implemented within a football club.	were also evident in basic football skills such as dribbling and marking.
Stamenković et al., 2024	/	6–12 years Additional Recreational Football Program, variable duration and training frequency, implemented within school programs.	The program improved muscular strength (e.g., 20 m sprint, Flamingo balance test) and cardiorespiratory fitness (resting HR, maximal HR); inclusion in school curricula is recommended to enhance physical health and prevent chronic diseases.

DISCUSSION

The results of studies included in the analysis of football-based programs in children demonstrate a consistent and significant association between structured sports participation and improvements in fundamental motor skills (FMS). Football training programs that integrate coordinative, locomotor, and manipulative skills provide multiple benefits for both motor and cognitive development in children. For instance, Alesi et al. (2015) reported that a six-month football program improved running performance, coordination, and lower-limb explosive strength, along with reduced visual discrimination time in children aged approximately nine years, suggesting a synergistic effect of sports participation on motor and cognitive functions. Similar findings were reported by Howells et al. (2022), where participation in a community-based football program resulted in significant improvements in balance, aiming, and catching skills in children with autism, while manual dexterity was not equally affected. These findings indicate that motor training may exert selective effects on specific components of FMS.

Beyond general motor competence, football programs also influence cognitive aspects of development. Alesi et al. (2016) highlighted that a six-month football intervention significantly enhanced agility, visuospatial working memory, attention, planning, and inhibition in children with a mean age of 8.8 years. Likewise, Chikha et al. (2021) demonstrated that a 10-week play-based football program led to improvements in agility, mental flexibility, and inhibitory control in children aged 11–12 years. These results support the theoretical assumption that complex motor tasks, particularly those embedded in football activities, strongly stimulate executive brain functions (Vestberg et al., 2012; Kun et al., 2012). Comparative analysis across studies further indicates the importance of program duration and training intensity. Aksoy and Saygın (2020) showed that an eight-week football training program conducted three times per week significantly improved body mass index, flexibility, handgrip strength, balance, fine motor skills, 30-m sprint performance, and aerobic capacity in children aged 11–13 years. Similarly, Mujezinović et al. (2022) reported that a structured football program consisting of 38 training sessions over three months resulted in significant improvements in 11 out of 16 assessed motor variables in young football players. These findings emphasize that training continuity and appropriate program structure directly influence the magnitude and scope of motor improvements. Specific training modalities further modulate training effects. Baškaya et al. (2023) demonstrated that dynamic core exercises combined with football training produced significantly greater improvements in motor abilities and football-specific skills compared with static core training or control conditions. This highlights the importance of active engagement of stabilizing and coordinative components. In a similar manner, motor games programs (Cuadro et al., 2021) and recreational football interventions (Stamenković et al., 2024) contributed to improvements in gross motor skills, muscular strength, and cardiorespiratory fitness, while simultaneously enhancing children's motivation to engage in physical activity. Such outcomes are particularly relevant for the prevention of sedentary behavior and childhood obesity. Cumulatively, the results indicate that football programs exert multidimensional effects: in addition to improving fundamental motor abilities, they promote cognitive development through coordinative, tactical, and perceptual

challenges. Football, as a sport requiring continuous adaptation, rapid reactions, and situational assessment, provides a naturally stimulating environment for the development of executive functions in children (Jansen et al., 2012; Chang et al., 2013). These effects are especially important during childhood, a period characterized by critical phases of brain and motor system development (Clark et al., 2002; Barnett et al., 2009). From a comparative perspective, it is evident that programs combining technical football skills, coordinative tasks, and game-based play are more effective than static or generic exercise programs. Activity complexity, training frequency and duration, as well as the inclusion of supplementary elements such as core training, directly influence the effectiveness of motor and cognitive development (Alesi et al., 2015; Başkaya et al., 2023; Aksoy & Saygın, 2020). These findings confirm that structured football programs represent an effective and ecologically valid approach for enhancing FMS and cognitive abilities, and their integration into school and sports programs from an early age is strongly recommended.

CONCLUSION

The analysis of the research findings clearly demonstrates that football training significantly enhances fundamental motor skills (FMS) in children, including locomotor, manipulative, and stabilizing abilities. Programs that combine coordinative tasks, football techniques, and ball games exhibit greater effects on motor skill development compared with static or generic exercises. Regular and continuous participation contributes to improved balance, agility, and movement precision, while the duration and frequency of training directly influence the magnitude and persistence of observed improvements. The inclusion of additional components, such as dynamic core exercises, further enhances children's motor and functional fitness. Football programs also stimulate cognitive development, improving executive functions, attention, working memory, and decision-making speed. Children engaged in complex and structured programs demonstrate faster reactions, more accurate situational assessment, and more efficient task execution. Motor games programs and recreational football training similarly contribute to increases in strength, cardiorespiratory fitness, and overall physical competence. Compared with control groups without structured activities, children participating in football programs achieve significantly better outcomes across all aspects of motor and cognitive development. Continuous stimulation of FMS during childhood lays the foundation for later success in sports, academics, and everyday activities. Football, as a complex and motivating activity, provides a natural environment for integrating motor and cognitive challenges. Programs combining play, coordination, and ball technique are particularly effective in developing complex motor patterns. Improvements in motor skills directly support self-confidence and motivation for physical activity. Planned and tailored training enables individual progression and mitigates the negative effects of sedentary behavior. These findings confirm that well-structured football programs represent an effective strategy for promoting health, physical fitness, and cognitive abilities in children. Based on this evidence, the integration of continuous and diverse football programs into school and sports activities from an early age is strongly recommended.

Ethics Statement

This study is a systematic review and does not involve any direct experiments or interventions on human or animal participants. Therefore, there was no requirement to obtain approval from an ethics committee. The study is based solely on the collection and analysis of relevant literature.

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