

Effect of Calisthenic Training on Agility and Explosive Power in Football Players: A Review

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Abstract

Background: Football performance depends heavily on physical attributes such as agility and explosive power, which are essential for rapid directional changes, sprinting, jumping, and overall match performance. Calisthenic training, which involves bodyweight-based exercises, has gained attention as a practical and sport-specific method for improving athletic performance. However, the extent of its effectiveness in enhancing agility and explosive power in football players requires systematic evaluation.

Objective: This review aims to analyze the effect of calisthenic training on agility and explosive power in football players and to determine its effectiveness as a training strategy for performance enhancement.

Methods: A systematic literature search was conducted using databases including PubMed, Google Scholar, Scopus, and other relevant electronic sources. Studies involving football players who underwent calisthenic or bodyweight-based training interventions and assessed outcomes related to agility and explosive power were included. Studies were screened based on predefined inclusion and exclusion criteria. Data related to study design, sample size, intervention type, duration, and outcome measures were extracted and analyzed qualitatively.

Results: The reviewed studies indicate that calisthenic training has a positive effect on both agility and explosive power in football players. Improvements were observed in change-of-direction speed, sprint performance, vertical jump height, and lower limb power output. The effectiveness of training was more prominent in interventions lasting 6–8 weeks or longer and when calisthenic exercises were combined with plyometric or sprint-based drills. However, variations in training protocols and assessment methods were noted across studies.

Conclusion: Calisthenic training appears to be an effective and practical approach for improving agility and explosive power in football players. It can be used as a cost-effective and equipment-free training method to enhance athletic performance. However, further high-quality randomized controlled trials with standardized protocols are recommended to strengthen the evidence base.

Keywords: Calisthenic training, football players, agility, explosive power, bodyweight exercise, performance enhancement.

INTRODUCTION

Football is a high-intensity intermittent sport that requires players to perform repeated bouts of sprinting, jumping, tackling, rapid acceleration, deceleration, and multidirectional movements throughout the game.

Success in football largely depends on physical fitness components such as agility, muscular strength, speed, balance, coordination, and explosive power. Among these variables, agility and explosive power are considered fundamental determinants of performance because they directly influence a player's ability to rapidly change direction, accelerate, react to opponents, and execute technical skills efficiently during competition [1].

Agility is defined as the ability to rapidly change body position or direction in response to a stimulus while maintaining balance and body control [2]. In football, agility is essential during dribbling, defending, tackling, and transitioning between offensive and defensive phases. Explosive power refers to the capability of muscles to exert maximal force in minimal time, which is important for sprint starts, jumping, kicking, and powerful directional changes [3]. Players possessing superior explosive power and agility are generally more effective in competitive match situations.

Traditional football conditioning programs mainly focused on endurance and resistance training; however, modern sports science emphasizes functional and sport-specific training approaches. One such approach is calisthenic training. Calisthenic exercises are bodyweight-based movements designed to improve muscular strength, neuromuscular coordination, flexibility, balance, and functional fitness without relying heavily on external equipment [4]. Common calisthenic exercises include squats, lunges, push-ups, burpees, mountain climbers, jumping drills, bounding, and plyometric movements. These exercises are increasingly incorporated into football conditioning programs because they mimic sport-specific movement patterns and improve athletic performance.

Calisthenic training enhances physical performance primarily through neuromuscular adaptations. Repeated bodyweight explosive movements improve motor unit recruitment, coordination between muscle groups, tendon stiffness, and efficiency of the stretch-shortening cycle (SSC) [5]. The SSC is particularly important in football because it allows rapid transition from eccentric to concentric muscle contractions, enabling athletes to generate greater force and speed during jumping, sprinting, and change-of-direction tasks [6].

Several researchers have investigated the effects of calisthenic and plyometric training on football players. Studies consistently report improvements in agility, sprint performance, vertical jump height, muscular endurance, and lower-body explosive power following structured bodyweight training programs [7]. Plyometric exercises, which are considered advanced forms of explosive calisthenic training, have demonstrated significant positive effects on football-specific physical fitness variables. These exercises stimulate fast-twitch muscle fibers and enhance the athlete's capacity to produce force rapidly [8].

Research evidence suggests that calisthenic training is particularly beneficial for football players because it is economical, requires minimal equipment, and can be performed on the field during regular training sessions [9]. Furthermore, bodyweight exercises reduce excessive mechanical loading associated with heavy resistance training while still producing meaningful improvements in athletic performance. This makes calisthenics especially useful for youth and adolescent football players whose musculoskeletal systems are still developing [10].

A systematic review conducted on male soccer players reported that plyometric and bodyweight explosive training significantly improved agility performance measured through tests such as the Illinois Agility Test, T-Test, and 505 Agility Test [11]. Similarly, another review concluded that multidirectional jumping and unilateral hopping drills improved change-of-direction speed and neuromuscular responsiveness in football athletes [12]. Meta-analyses have also demonstrated improvements in countermovement jump

performance, sprint acceleration, and lower-extremity explosive strength after calisthenic and plyometric interventions [13].

Despite growing research in this field, variations exist among training protocols, exercise selection, duration, intensity, and participant characteristics. Some studies focus mainly on plyometric exercises, while others combine calisthenics with resistance or sprint training. Therefore, there is a need to comprehensively review the available literature regarding the effect of calisthenic training on agility and explosive power in football players.

Hence, the present review aims to analyze and summarize the existing scientific evidence regarding the effectiveness of calisthenic training on improving agility and explosive power among football players.

MATERIALS AND METHODS

Study Design

The present study is a narrative review conducted to evaluate the effect of calisthenic training on agility and explosive power in football players [11,12].

Sources of Data

Relevant research articles were collected from online databases and scientific search engines including:

- Google Scholar
- PubMed
- ResearchGate
- SpringerLink
- Frontiers
- ScienceDirect

Search Strategy

The following keywords were used individually and in combination:

- “Calisthenic training in football players”
- “Bodyweight training and agility”
- “Plyometric training in soccer”
- “Explosive power in football players”
- “Agility training in football”
- “Neuromuscular training and football performance”

The search strategy was developed based on previous systematic reviews related to football conditioning and plyometric training [11,12,13].

Inclusion Criteria

The studies included in this review met the following criteria:

1. Studies involving football/soccer players [1].
2. Studies examining calisthenic, bodyweight, or plyometric training [6,8].
3. Studies measuring agility and/or explosive power [2,3].
4. Peer-reviewed articles, systematic reviews, and meta-analyses [11,12].
5. Articles published in English.

Exclusion Criteria

1. Studies unrelated to football players.
2. Studies without agility or explosive power outcomes.
3. Duplicate articles.

4. Non-English publications.

Data Extraction

Relevant information extracted from the selected studies included:

- Author and year
- Sample characteristics
- Training duration
- Exercise protocols
- Outcome measures
- Major findings related to agility and explosive power [11,12,13].

RESULTS

A structured literature search was carried out using multiple academic databases including Google Scholar, PubMed, ResearchGate, SpringerLink, Frontiers, and ScienceDirect.

In the initial search, about 132 research articles were identified. After removing duplicates, 104 articles were screened based on title and abstract relevance. From this stage, 61 articles were excluded because they were either not related to football players, did not focus on calisthenic or plyometric training, or did not assess agility and explosive power outcomes.

A total of 43 full-text articles were further assessed for eligibility. Among these, 24 articles were excluded due to lack of appropriate intervention design, absence of relevant performance outcomes, or insufficient methodological clarity. Finally, 19 studies, including experimental trials, systematic reviews, and meta-analyses, were selected for the final review [11,12,13].

The findings from the selected studies consistently showed that calisthenic and plyometric training positively influence agility and explosive power in football players across different age categories and competitive levels [11,12].

Most of the included studies implemented training interventions lasting between 6 and 12 weeks, with a frequency of 2 to 3 sessions per week [11,12,13]. The commonly used exercises included jump squats, bounding drills, burpees, lateral hops, split squat jumps, and box jumps [6,8].

Improvements in agility performance were frequently assessed using standardized field tests such as the Illinois Agility Test, T-Test, and 505 Change of Direction Test [2,11]. The systematic review by Ramírez-Campillo et al. [11] reported that plyometric-based bodyweight training significantly improved agility and change-of-direction performance in male football players. In a similar manner, Chaabene et al. [12] found that multidirectional plyometric exercises enhanced neuromuscular responsiveness and change-of-direction ability.

Enhancements in explosive power were mainly observed through improvements in countermovement jump, squat jump, vertical jump height, and sprint acceleration performance [6,13]. Meta-analytic evidence further confirmed moderate to large improvements in lower-body explosive strength following structured calisthenic and plyometric training programs [13].

Additionally, several studies reported that younger football players showed greater improvements compared to older athletes, which may be attributed to higher neuromuscular adaptability and better training responsiveness during developmental stages [9,10].

TABLE 1: CHARACTERISTICS OF INCLUDED STUDIES

Author & Year	Type of Study	Sample Size	Population	Intervention	Outcome Measures	Conclusion
Silva AF et al. ¹⁹ (2026)	Meta-analysis	Not specified	Elite youth football players	Plyometric training programs	CMJ, SJ, sprint, explosive power	Significant improvement in lower-limb explosive power
Chaabene H et al. ¹² (2024)	Systematic review	Not specified	Male football players	Plyometric training	COD tests, agility tests	Improved change of direction ability
Ramírez-Campillo R et al. ¹¹ (2022)	Systematic review	Not specified	Male soccer players	Plyometric training	Agility tests (T-test, Illinois)	Significant improvement in agility
Stojanović E et al. ¹⁶ (2017)	Meta-analysis	Not specified	Athletes (multiple sports)	Plyometric training	Vertical jump, power tests	Strong improvement in jump performance
Slimani M et al. ¹⁷ (2016)	Systematic review	Not specified	Team sport athletes	Plyometric training	Strength, speed, agility	Improved overall physical fitness
Asadi A et al. ¹⁵ (2016)	Meta-analysis	Not specified	Athletes	Plyometric training	Change of direction ability	Significant COD improvement
Behm DG et al. ⁷ (2017)	Review	Not specified	Trained athletes	Strength vs power training	Strength, speed, power	Power training more effective for explosiveness
De Villarreal ES et al. ¹⁴ (2012)	Meta-analysis	Not specified	Athletes	Plyometric training	Sprint performance	Improved sprint ability
Chaouachi A et al. ¹⁹ (2014)	Experimental study	~30–40	Youth soccer players	Combined strength + plyometric training	Sprint, jump, agility	Significant performance improvement
Brughelli M et al. ¹⁸ (2008)	Review	Not applicable	Athletes	COD training concepts	Agility, COD ability	COD depends on strength and technique

Lloyd RS, Oliver JL. ¹⁰ (2012)	Conceptual paper	Not applicable	Youth athletes	Physical development model	Athletic development parameters	Long-term athletic development emphasized
Faigenbaum AD, Myer GD. ⁹ (2010)	Review	Not applicable	Youth athletes	Resistance training	Strength, injury prevention	Safe and effective for youth development
Miller MG et al. ⁸ (2006)	Experimental study	~20–30	Soccer players	6-week plyometric training	Agility test (T-test)	Significant agility improvement
Harrison JS. ⁴ (2010)	Review	Not applicable	Athletes	Bodyweight training	Strength, performance	Calisthenics improve functional strength
Markovic G, Mikulic P. ⁶ (2010)	Review	Not applicable	Athletes	Plyometric training	Jump performance	Strong neuromuscular adaptations
Komi PV. ⁵ (2000)	Theoretical paper	Not applicable	Muscle physiology	Stretch-shortening cycle	Muscle performance	SSC is key for explosive actions
Sheppard JM, Young WB. ² (2006)	Review	Not applicable	Athletes	Agility training concepts	Agility tests	Defines agility classification and training
Bompa TO, Buzzichelli C. ³ (2015)	Book (theoretical)	Not applicable	Athletes	Periodization training	Performance development	Structured training improves performance
Reilly T et al. ¹ (2000)	Physiological study	Not specified	Elite soccer players	Match demands analysis	Physiological profiling	Identifies key performance requirements

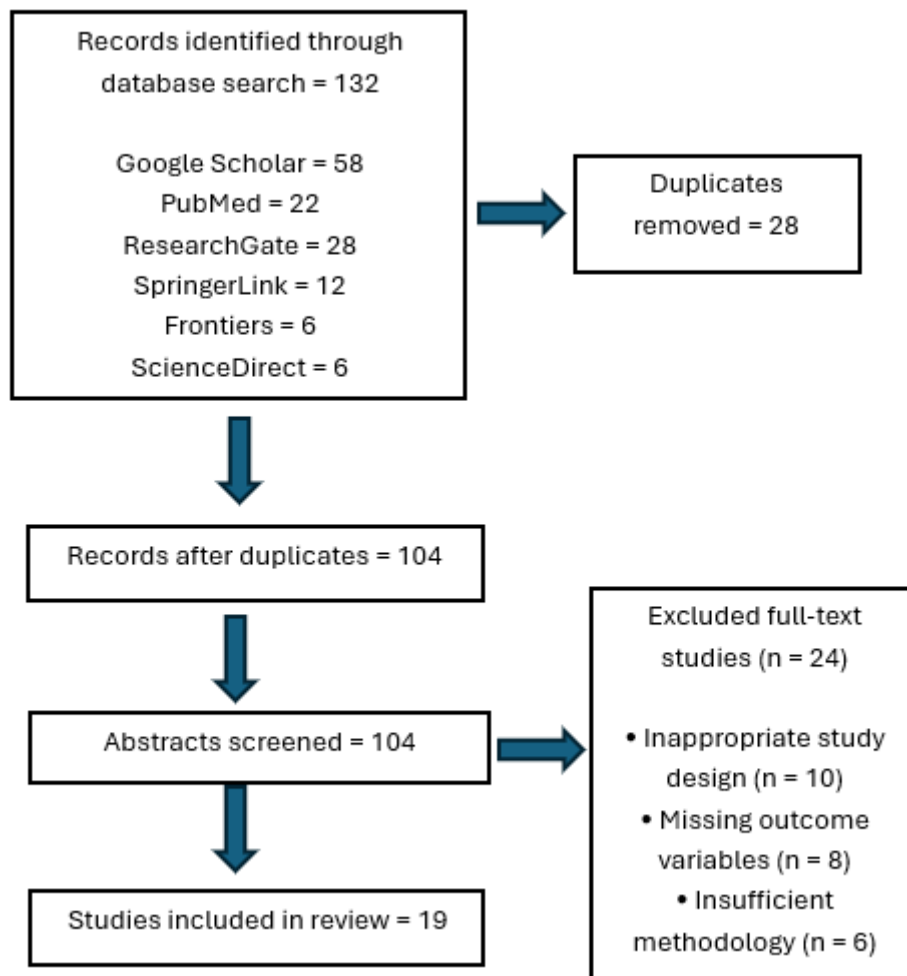


Figure 1: Flowchart of eligible studies

DISCUSSION

The present review analyzed the effects of calisthenic training on agility and explosive power in football players. The findings indicate that calisthenic and plyometric bodyweight exercises are highly effective for enhancing football-specific physical performance [11,12,13].

The observed improvements in agility may be attributed to enhanced neuromuscular coordination, balance, reaction speed, and muscular control developed through explosive bodyweight movements [5,8]. Exercises such as lateral hops, multidirectional jumps, and bounding drills improve an athlete's ability to decelerate and rapidly change direction, which are critical requirements in football performance [2].

Explosive power improvements reported in the reviewed studies are likely associated with increased efficiency of the stretch-shortening cycle and enhanced recruitment of fast-twitch muscle fibers [5,6]. Plyometric exercises produce rapid eccentric-concentric muscle actions that improve rate of force development and elastic energy utilization, leading to enhanced jumping and sprinting performance [7].

Another important finding of the review is that training duration and frequency significantly influence outcomes. Most successful interventions lasted between 6–12 weeks with 2–3 weekly sessions [11,12]. This suggests that consistent exposure to explosive calisthenic stimuli is necessary to induce meaningful neuromuscular adaptations.

The reviewed literature also suggests that calisthenic training is particularly useful for youth football players because it improves functional strength without imposing excessive external load on developing musculoskeletal structures [9,10]. Additionally, calisthenics require minimal equipment, making them practical and economical for coaches and athletes [4].

Despite positive findings, some limitations were identified within the literature. Variations in study design, exercise protocols, sample size, and testing procedures make direct comparisons difficult [11,12]. Furthermore, few studies isolated calisthenic training alone, as many combined bodyweight exercises with sprint or resistance training [13].

Overall, the evidence strongly supports incorporating calisthenic and plyometric exercises into football conditioning programs to improve agility and explosive power in football players [11,12,13].

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