The effect of Small-Sided-Games on improving some physical qualities and techno-tactical competencies among junior football players

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Abstract:

This research aims to investigate the effect of small-sided games characteristics on both the explosive power of the lower limbs and the passing skill among intermediate-level football players. The researcher developed a training program based on small-sided games and employed the experimental method. The sample consisted of 20 players who were intentionally selected. To collect data, the researcher used the vertical jump test from a static position and the short pass test. The findings revealed that the proposed program based on small-sided games had a positive effect on both the explosive power of the lower limbs and the passing skill of football players.

Keywords: Small-sided games, explosive power of the lower limbs, passing, football players.

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1. INTRODUCTION

Football continues to witness rapid and diverse developments in recent years across all preparatory and training dimensions, alongside the evolution of tools that support optimal player care. Preparing players for official matches remains the main concern for all members of the technical staff, including the head coach, assistants, and physical trainers. To this end, these professionals rely on various training methods, both traditional and modern.

Continuous training is essential to mastering all physical, technical, and tactical aspects of the game (Mahmoud, 2013). To achieve this, the coach must select appropriate exercises, training scenarios, and optimal implementation methods that align with the players' skill level and the game's demands, ultimately aiming to elevate performance to its highest possible level.

According to (Chiha, 2022), the goal of programming football training sessions is to achieve a positive outcome from the training effects in order to develop individual and collective capabilities and, above all, to ensure optimal readiness on match day. Training aims to allow players to express their techno-tactical abilities at their best and for the longest possible duration throughout the match and even across the season. It enables players to perform effectively in all game situations.

The use of small-sided games (SSGs) has become increasingly widespread in football training (Allal, 2020), especially within integrated training models that incorporate the ball in all proposed exercises—whether for physical conditioning or techno-tactical work—across various age categories, up to the first team (Ancian, 2008).

Small-sided games vary in their rules: some follow the official laws of the game (11 vs. 11), while others do not (e.g., throw-ins are played with the feet). However, the differences lie mainly in pitch dimensions,

the use of small goals, the number of players involved (attackers and defenders), and the specific coaching instructions given, such as limiting ball touches or types of passes. The more training conditions resemble match situations, the more beneficial the training becomes (Boudouani, 2019).

The intensity of effort also varies from one small-sided game to another based on the coach's directives. The individual technical aspects (e.g., ball control, movement into space) and collective techno-tactical dimensions (e.g., ball recovery, possession maintenance, and advancing toward the opponent's goal) are prominently highlighted.

2. The problem

Based on this context, the present study seeks to answer the following main question:

Does a training program based on small-sided games have a positive effect on improving certain physical attributes and techno-tactical skills among football players?

To address this central question, we pose the following sub-questions:

1. Does the training program based on small-sided games positively impact the explosive power of the lower limbs in football players?
2. Does the training program based on small-sided games positively impact the short passing skill in football players?

3. Research Hypotheses:

3.1 General Hypothesis:

A training program based on small-sided games has a positive effect on improving certain physical attributes and techno-tactical skills among football players.

3.2Specific Hypotheses:

1. There are statistically significant differences between pre- and post-tests in explosive lower limb power due to

the training program based on small-sided games.

2. There are statistically significant differences between pre- and post-tests in short passing skill due to the training program based on small-sided games.

4.Definition of Terms and Concepts:

4.1. Small-Sided Games (SSGs):

Defined as "those enjoyable drills conducted in confined spaces with a specific number of players, whether equal or unequal, depending on the set objectives" (Hanafi Mahmoud Mokhtar, 1992, p. 135).

Operationally: Training drills and scenarios using the ball under match-like conditions in reduced areas of the pitch.

4.2. Explosive Power of Lower Limbs:

Defined as the highest dynamic force that a muscle or muscle group can produce in a single effort.

Operationally: Refers specifically to the lower limbs of football players.

4.3. Passing:

A technical skill involving delivering the ball to a teammate.

5. Significance of the Study:

The study's significance lies in the design of a training program using small-sided games distributed over six weeks, with three sessions per week, totaling 18 training units.

6. Objectives of the Study:

• To design a training program using small-sided games.

• To determine the effect of the proposed program on improving lower limb explosive power among football players.

• To determine the effect of the proposed program on improving the passing skill among football players.

7.Rationale for Choosing the Study Topic:

•Focus on the impact of small-sided games as a training method

addressing both physical and techno-tactical aspects.

•Contribute a practical program for coaches and physical trainers.

•Raise awareness among professionals about the diverse objectives achievable through small-sided games depending on their types.

•Shift from unstructured fun and entertainment to a well-planned and programmed training approach.

8. Applied Aspect and Methodological Procedures of the Study:

(EXPERIMENTAL)

8.1. Pilot Study: To assess the field conditions and the feasibility of implementing the proposed small-sided games training program and the physical and technical tests on the study sample, the researcher conducted a pilot study involving six players from the Khroub Sports Association (under-19 category), active in the amateur division, during the early part of the 2023 season (August 6 to 13, 2023). The following results were obtained:

•Final design of the physical and technical test result recording sheet.

•Preparation of the field research team.

•Confirmation of the scientific validity of the research tools.

8.2.Study Variables:

Independent Variable: The proposed training program using small-sided games.

Dependent Variables: Explosive power of the lower limbs and passing skill.

8.3.Research Method:

The experimental method was adopted due to its suitability for the research nature.

8.4.Research Sample:

The sample consisted of 20 players from the under-19 team of the Khroub Sports Association.

Excluded: Injured players and those absent from training sessions or testing.

Table 1: Sample Characteristics

Variable	Unit	N	Mean	Standard Deviation
Age	Years	20	19.38	0.50
Height	Meters	20	1.76	0.03
Weight	Kg	20	73.38	2.42
Training Age	Years	20	4.88	0.99

Source: Walid Lasbahani, 2025

9. Research Fields:

9.1 Spatial Field: Abed Hamdani Stadium, El Khroub Municipality, Constantine Province.

9.2 Temporal Field: Pre-test: September 3, 2023. Post-test: November 22, 2023. Proposed training program: from September to November 2023.

9.3 Human Field: The sample under study consists of 20 youth players from the El Khroub Association Football Club (ASK U19).

10. Data Collection Tools:

10.1. Scientific Sources and References:

•Previous and similar studies.

•Specialized books and journals in sports training.

•Doctoral theses directly related to the subject of the research.

•Peer-reviewed scientific articles published in Arabic and foreign languages.

10.2.Physical and Skill Tests:

Appropriate physical and skill tests were selected to measure the studied characteristics.

10.2.1. Vertical Jump Test:

•**Test Name:** Standing Vertical Jump

•**Purpose:** To measure the explosive strength of the lower limb muscles

•**Test Procedures:**

The subject stands facing the wall with one shoulder and holds a piece of chalk between the thumb and middle fingers.

The subject extends the arm upward to make a mark at the highest point reachable without lifting the heels off the ground; the number aligned with the mark is recorded.

From the standing position, the subject swings the arms forward and then backward while performing a semi-squat, then swings the arms upward while fully extending the knees to jump vertically and mark the wall at the highest point reached using the chalk.

•**Scoring Method:**

- The subject performs two trials; the best result is recorded.

•The score is the distance in centimeters between the first and second marks, indicating the explosive muscle strength. (Aziz, 2013)

•**Equipment Used:** Graduated wall with appropriate height, chalk.

10.2.2. Short Passing Accuracy Test:

•**Test Name:** Short Passing Accuracy Test to the Bench from 10 meters with 9 balls

•**Purpose**: To measure short pass accuracy

•**Equipment Used:** 3 benches, Chalk (or gypsum) to mark the passing area, 6 cones/flags, 9 footballs.

Performance Method:

•Two parallel lines are drawn 10 meters apart, each 3 meters long. The bench (2.50 m x 50 cm), divided into 5 zones using flags, is placed 10 meters away from the starting line.

•Balls are placed behind the start line. Upon the start signal, the player runs to pick up a ball, returns to the starting position, and passes the ball toward the bench or between the flags. This continues until all 9 balls are used.

•If the bench or flags are missed, the attempt is invalid.

•The player must return quickly for the next pass.

•If the ball lands on the line or flag between sections, the score is counted according to the defined zones (A-B-C).

•No stopping is allowed during the test.

•For balls directed to the center of the bench: the player has three attempts and scoring is based on Zone A.

•For balls directed to the right or left: the player also has three attempts each, with scoring based on Zones B and C respectively.

•The final score is the sum of the scores from the nine attempts.

(Aziz, 2013)

•**Unit of Measurement:** Score

11.Scientific Validity of the Instruments:

11.1 Test Validity: The researcher relied on content validity to determine the validity of the two tests, as they measure the intended traits. The tests have validity coefficients supported by previous studies and specialized sports training references. Additionally, the square root of the reliability coefficient was calculated to estimate the intrinsic validity coefficient.

11.2.Test Reliability: The researcher applied a test-retest method on a pilot group of 6 players from El Khroub Association (outside the main sample) under the same testing conditions to verify the reliability of the two tests.

Table 2: Validity and Reliability Coefficients of the Two Tests

Test	Unit	First Application		Second Application		Reliability coefficient	Validity Coefficient
		Mean	Standard Deviation	Mean	Standard Deviation		
Vertical Jump Test	Cm	45	1,41	43	1,26	0,89	0,94
Short Passing Test	Score	24,83	1,17	23,83	1,47	0,92	0,96

Source: Walid Lasbahani, 2025

It is clear from the results of Table 2 that both the physical and technical tests exhibit high levels of reliability and validity, with reliability coefficients of 0.89 and 0.92, and self-validity coefficients of 0.94 and 0.96, respectively.

11.3. Test Objectivity: One of the essential characteristics of a good test is objectivity. Since the tester uses precise measuring instruments, the margin of error is reduced, and the tester's subjectivity is minimized. This enhances the objectivity of the tests under study.

12. Experimental Design: The researcher employed a within-subject experimental design, where the same group was tested using a training program preceded by pre-tests and followed by post-tests. The differences observed between the pre-test and post-test measurements are attributed to the effect of the proposed program.

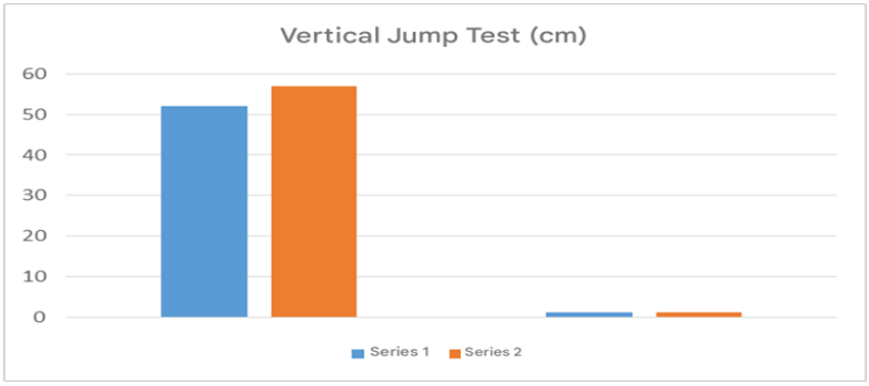
12.1. Characteristics of the Training Program: The proposed training program includes training units spread over six weeks, with three sessions per week, totaling 18 sessions. The program uses small-sided games with varying intensities, ranging from moderate to high.

13. Statistical Methods Used in the Study: Data were statistically processed using the SPSS program by calculating: means, standard deviations, and the paired samples t-test.

1-Results and discussion of the research

Presentation and analysis of the first hypothesis: It states that there are statistically significant differences between the pre-test and post-test results in the explosive power test of the lower limbs due to the use of the small-sided games-based training program.

Figure 1: represents the means and standard deviations of the vertical jump test.



Source: Walid Lasbahani, 2025

Figure 1 shows that the mean scores of the pre-tests and post-tests for the vertical jump were in favor of the post-tests, with values of (51.95 cm and 56.85 cm) respectively.

To determine whether these differences are statistically significant, a paired t-test was used. The results are presented in the following table:

Table 3: Statistical Analysis of the Vertical Jump Test Results

Statistical Significance	p-value	Significance Level	Degree of Freedom	t-value	Standard Deviation	Mean	Statistical Variables
Significant	0,000	0,05	19	20.63	1.27	51.95	Pre-test
					1.21	56.85	Post-test

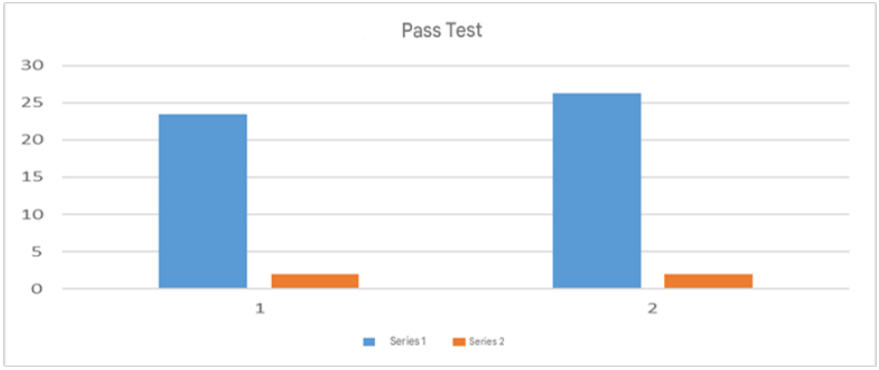
Source: Walid Lasbahani, 2025

Table 3 shows that the calculated t-value is 20.63 at a degree of freedom of 19 and a significance level of 0.05. Since the p-value is 0.000, which is lower than the significance level of 0.05, this indicates that there are statistically significant differences between the pre-test and post-test measurements in favor of the post-test.

Presentation and Analysis of the Second Hypothesis:

The second hypothesis stated:"There are statistically significant differences between the pre-test and post-test results in the passing test, due to the use of the training program based on small-sided games."

Figure 2: represents the means and standard deviations for the passing test.



Source: Walid Lasbahani, 2025

Figure 2 shows that the mean scores of the pre-test and post-test for the passing test were higher in favor of the post-test, with values of (23.4 and 26.25) points respectively. To determine whether these differences are statistically significant, a paired samples t-test was used. The results are presented in the following table:

Table 4: Statistical analysis of the passing test results.

Statistical Significance	p-value	Significance Level	Degrees of Freedom	t-value	Standard Deviation	Mean	Statistical Variables
Significant	0,000	0,05	19	1,72	1,98	23,4	Pre-test
					2,02	26,25	Post-test

Source: Walid Lasbahani, 2025

Table 4 shows that the calculated t-value is 1.72 at a degree of freedom of 19 and a significance level of 0.05. Since the p-value is 0.000, which is less than the significance level of 0.05, this indicates that there are statistically significant differences between the pre-test and post-test measurements, in favor of the post-test.

Discussion of the First Hypothesis:

The results of the statistical analysis showed statistically significant differences between the pre-test and post-test measurements in the vertical jump test, in favor of the post-test. This confirms the validity of the first hypothesis, which stated that the proposed training program based on small-sided games has a positive effect on the explosive strength of the lower limbs of the study sample. This finding is consistent with the results of the studies conducted by (Dellel, 2008) and the study of (Tchokonté, 2011).

The researcher believes that the observed improvement in this physical quality is due to the players' response to the planned training load and the effectiveness of training using small-sided games, as well as its impact on the development of the players' physical aspects. Indeed, consistency in training leads to positive changes, especially when training occurs in situations that resemble real matches, such as quick movements, changes in direction, jumping to hit the ball, accelerations, and sudden stops. This is known as training specificity, as stated by (Brain. Mackenzie, 1999, p. 118) who said: "The golden rule of any training program is specificity, which means that the movements performed by the player during training must be similar to the movements they will encounter in competition."

This is confirmed by the study of Jaghdam Bin Dhahabiya (2013), which indicates that small-sided games training positively affects the development of physical attributes in football players. From the above, we confirm that the training program based on small-sided games proved its effectiveness, as it contributed positively to the development of explosive strength of the lower limbs in the study sample. Accordingly, we affirm the validity of the first hypothesis.

Discussion of the second hypothesis:

The statistical analysis results showed significant differences between the pre-test and post-test measurements in the passing test, in favor of

the post-test. This confirms the validity of the second hypothesis, which stated that the proposed training program using small-sided games has a positive effect on passing skill (Dellel, 2013), which agrees with the study of [name/study to be added].

Training using small-sided games is considered effective in developing physical and skill attributes in an integrated and comprehensive manner. This is known as integrated physical preparation, which is a modern approach where physical attributes such as strength, speed, and speed-strength are developed, for example, by using skill exercises related to physical aspects. This is supported by the phrase: "It is about integrating the ball with physical work, which allows players to acquire both skill and physical capacities."

Discussion of the General Hypothesis:

The results of the statistical analyses clearly demonstrate significant improvements in both the explosive strength of the lower limbs, as measured by the vertical jump test, and the passing skill, as measured by the passing accuracy test, following the application of the training program based on small-sided games. These findings confirm the overall validity of the general hypothesis that the proposed training program has a positive effect on the physical and skill components of the players.

The observed improvements in explosive strength are attributed to the players' positive response to the planned training load and the effectiveness of small-sided games, which simulate real match conditions involving rapid movements, direction changes, jumping, accelerations, and stops. This aligns with the principle of training specificity, as emphasized by Brain Mackenzie (1999), who stated that the movements in training should closely mimic those in competition to maximize effectiveness. This result is consistent with studies by Dellal (2008), Sylvain Alain Monkam Tchokonte (2011), and Jaghdam Bin Dhahabiya (2013), all of whom highlighted the benefits

of small-sided games in enhancing physical attributes in football players.

Furthermore, the significant enhancement in passing skill following the training program confirms its efficacy in developing technical abilities. Small-sided games foster an integrated and comprehensive development of both physical and skill attributes, which is characteristic of modern integrated physical preparation. This method combines technical skill exercises with physical training, allowing players to simultaneously develop strength, speed, and coordination, as supported by Alexander Dellal (2008). This integrated approach is effective because it mirrors the complex demands of actual match play, thereby improving players' overall performance.

In summary, the training program based on small-sided games effectively improves both explosive physical capacities and technical passing skills in young football players, confirming the overall hypothesis and supporting the adoption of such training methods in football development programs.

Conclusion:

This study aimed to examine the impact of small-sided games on improving certain physical attributes and technical-tactical competencies among youth football players. These training sessions take place under conditions that closely resemble official matches, characterized by continuous movement to regain and maintain ball possession using skills such as passing, receiving, changing direction, accelerating, positional changes, and contests for ground and aerial balls through jumping and heading. All of these activities occur within small playing areas that simultaneously enhance both the physical and technical aspects of the players.

Based on the results of this study, it can be concluded that there is a significant improvement in the physical qualities and technical-tactical competencies examined through the proposed training program based

on small-sided games. This is evidenced by the clear differences between the pre-test and post-test results in favor of the post-test, which can be attributed to the effectiveness of the training program.

Bibliography List :

1- Chiha, F. (2022). *le guide du préparateur physique: Analyse de l'activité du football, les facteurs de la performance*. Ain M'lila. Algeria: Dar Elhouda.

2- Dellel, A. (2008). *de l'entrainement a la performance en football*. Paris: groupe de boeck.

3- Tchokonté, S. A. (2011). *Évolution du football et conséquences sur l'entraînement et la préparation physique : application à l'étude des incidences des jeux-réduits sur les adaptations des joueurs* (Doctoral dissertation, Strasbourg). Retrieved from https://theses.fr/2011STRA1050

4- Ancian, J.-P. (2008). *Football : une préparation physique programmée*. Paris: édition Amphora.

5- Allal, C. H. (2020). *The impact of a proposed training program based on mini-games on developing the skill requirements of young football players* (Thèse de Doctorat, University of Algiers). Retrieved from https://dspace.univ-alger3.dz/jspui/handle/123456789/8207

6- Boudouani, A. (2019). *The effect of high-intensity interval training and small-sided game training on some physical and physiological indicators of under-18 football players* (Thèse de Doctorat, University of Mostaganem). Retrieved from https://e-biblio.univ-mosta.dz/items/78b1c4c9-03f5-46a1-bc54-170d97292d02

7- Mahmoud, G. S. (2013). *Football Physical Training*. Amman: Arab Community Library.

8- Dellal, A. (2013). *Une saison de préparation physique en football*. Bruxelles: édition De boeck.