

The Effect of a Proposed Mini-Games Program on the Development of Certain Basic Skills (Overhead and Underhand Passing) in Volleyball - A field study on the school team of Khadija Umm al-Mu'minin Secondary School in Batna-

أثر برنامج مقترح بالألعاب المصغرة على تنمية بعض المهارات الأساسية (التمرير من أعلى والتمرير من أسفل) في الكرة الطائرة –دراسة ميدانية على الفريق المدرسي لثانوية خديجة أم المؤمنين باتنة -

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Abstract: This study aimed to investigate the effect of a proposed mini-games-based program on developing certain basic volleyball skills—specifically, overhead passing and underhand passing. It was conducted as a field study on the school volleyball team (ages 15–18) at Khadija Umm Al-Mu'minin Secondary School in Batna. The study sample consisted of 12 players selected purposefully through a mini-volleyball tournament among the school's classes.

A pre-test was conducted to assess the overhead and underhand passing skills, followed by a 12-session training program using mini-games. A post-test was then administered. The experimental method was employed, and the results showed statistically significant improvements between the pre- and post-tests in both skills, favoring the post-test. This indicates the effectiveness of the program in enhancing the players' performance.

Keywords: Mini-games, volleyball, basic skills (overhead passing, underhand passing), cadet category.

الملخص : هدفت هذه الدراسة الى معرفة اثر برنامج مقترح بالألعاب المصغرة على تنمية بعض المهارات الأساسية (التمرير من الأعلى والتمرير من الأسفل) في الكرة الطائرة دراسة ميدانية علي الفريق المدرسي اشبال(15-18) سنة لثانوية خديجة ام المؤمنين باتنة، وتمثلت عينة الدراسة في 12 لاعب تم اختيارهم بطريقة قصدية عن طريق تنظيم دورة مصغرة في الكرة الطائرة بين اقسام الثانوية، بعدها تم القيام باختبار قبلي في مهارة التمرير من الأعلى واختبار التمرير من الأسفل وقمنا بتسطير برنامج تدريبي مقترح بالألعاب المصغرة يشمل 12 حصة تدريبية على الفريق، وبعدها قمنا بالاختبار البعدي، وقد تم استعمال المنهج التجريبي في الدراسة واسفرت النتائج ما يلي:

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و جود فروق ذات دلالة إحصائية بين الاختبارين القبلي والبعدي في مهارة التمرير من الأعلى ومهارة التمرير من الأسفل لصالح الاختبار البعدي، مما يدل على فاعلية البرنامج في تحسين الأداء المهاري للاعبين .
-الكلمات المفتاحية : الألعاب المصغرة، الكرة الطائرة، المهارات الأساسية (التمرير من الأعلى، التمرير من الأسفل)،
فئة الأشبال.

❖ Theoretical Framework

Volleyball is a team sport that has witnessed significant development and widespread popularity around the world since its inception. It is characterized by unique features that distinguish it from other team sports, as it requires a high degree of harmony, coordination, and mutual understanding among players. Each player occupies a specific position, forming a pivotal element in both offensive and defensive gameplay. Competition serves as a true measure of a player's performance in volleyball; however, for many cadet players (ages 15–18), competitive matches may induce psychological stress that negatively affects their physical, technical, and tactical performance. Tension during competition can be a major obstacle to performance improvement, which is often reflected in the player's behavior on the court (Hadjira, 2018, p3).

As a team sport, volleyball requires the design of annual training programs that address various preparation aspects—physical, technical, tactical, and mental (Toumiat, 2025, p.157). Proper program design and supervision must be accompanied by the implementation of tests and the collection of relevant data, which reflect the actual progress of athletes. Without scientifically grounded and deliberate decision-making based on this data, it is difficult to improve the learning or training process and elevate the athlete's performance.

Basic volleyball skills consist of purposeful movements, whether simple (individual) or complex (team-based), that are necessary in nearly all game situations. The main purpose of mastering these movements is to achieve optimal results with minimal energy expenditure. Therefore, a volleyball player

must excel in these fundamental skills, as they are essential for executing tactical strategies—whether defensive or offensive—designed to achieve victory (Al-Dulaimi, 2011, p.35)

This is where the importance of structured training plans or training cycles becomes evident. These plans are essential in many sports, whether team-based or individual. In volleyball specifically, they contribute to the development of numerous skills and techniques such as serving, blocking, setting, spiking, and passing. Passing, in particular, is a foundational element for evaluating the effectiveness of training programs and the performance of players during matches. Well-planned training programs not only enhance performance but also add aesthetic value to the sport, increasing its appeal and encouraging more participation. Furthermore, such planning facilitates the learning of more complex skills by incorporating various physical components like strength, speed, agility, endurance, and passing skills, along with compound physical attributes, all of which are necessary for properly executing a mini-training cycle. When all players master both basic and advanced skills—such as overhand and underhand passing—the team's overall performance improves significantly. This is especially relevant in volleyball, which is marked by distinct features and specialized techniques (Sadouki, 2021, p.13).

In line with the objectives of this research, we present the following related studies:

Aref Abdullah (2017) conducted a study titled "The Effect of a Proposed Program on the Development of Serving, Receiving, and Passing Skills in Volleyball for Cadet Category." The results showed that the training program contributed positively to skill development. The study emphasized the need for coaches to diversify their training methods to enhance skill acquisition, which in turn improves athletic performance.

Mounir Zireg (2020) studied "The Effect of a Play-Based Educational Program on Developing Basic Volleyball Skills among Third-Year Middle School Students." The findings confirmed that the play-based method significantly contributed to teaching serving and receiving skills, and that such simplified educational units are essential for helping young learners acquire and perform skills effectively.

Ali Cheqrani et al. (2015) examined "The Role of Mini-Games in Developing Basic Skills in Volleyball for Youth Aged 13–15." The study concluded that the experimental group showed a greater improvement in targeted basic skills compared to the control group, based on post-test results.

Omar Sadeq and Al-Ayadi (2016) conducted a study on "The Impact of Mini-Games on Skill Performance in Volleyball for Secondary Level Players (Ages 15–18)." They concluded that sports training, particularly when incorporating mini-games, significantly contribute to enhancing both individual and collective performance.

From these studies, we note that the first and second focused on the impact of proposed training programs on the development of volleyball skills in the cadet category. Both studies share similarities in sample characteristics and sought to improve key volleyball skills.

The third study emphasized the use of mini-games in improving fundamental skills, reaching similar positive conclusions. The fourth study confirmed the positive effect of mini-games on skill development in secondary-level players (15–18 years old).

Problem Statement and Research Questions

Based on the theoretical background and previous studies, we pose the following main research question:

Does the proposed mini-games program have an effect on developing certain basic volleyball skills (overhead and underhand passing)?

From this, the following sub-questions arise:

Does the mini-games program enhance the underhand passing skill among cadet volleyball players aged 15–18?

Does the mini-games program enhance the overhead passing skill among cadet volleyball players aged 15–18?

Research Hypotheses

To answer these questions, the following hypotheses were proposed:

The proposed mini-games program has a positive effect on developing certain basic volleyball skills (overhead and underhand passing) for the cadet age group (15–18 years).

Sub-hypothesis 1: Mini-games positively impact the development of the underhand passing skill in volleyball for the cadet category.

Sub-hypothesis 2: Mini-games positively impact the development of the overhead passing skill in volleyball for the cadet category.

Research Objectives

This research aims to:

Determine the effect of the proposed mini-games training program on overhead and underhand passing skills in volleyball.

Highlight the importance of using mini-games as a tool in volleyball training and education.

Significance of the Study

Theoretical Significance: The study contributes to the academic field by enriching the literature on developing basic volleyball skills.

Practical Significance: It provides volleyball coaches and physical education teachers with a practical training program using mini-games, as well as standardized tests for the evaluated skills.

Definitions of Key Terms

Volleyball:

Theoretical Definition: A team sport governed by specific rules, played on a marked court with a net, and requiring coordination and agility. It is considered one of the most widely practiced sports, particularly in school settings (Ali Mustafa Taha, 1996, p.102).

Operational Definition: A recreational team sport played by two teams of 6 players each (6 vs. 6), aiming to ground the ball in the opponent's court. It includes key skills like serving, overhand passing, underhand passing, blocking, and spiking.

Basic Skills:

Theoretical Definition: Fundamental technical elements, both offensive and defensive, are forming the backbone of the game. They must be considered in conjunction with psychological and cognitive preparation during the sports season (Wadie Al-Tikriti, 1996, p.85).

Operational Definition: The foundation of volleyball; without mastering them, performance goals cannot be achieved.

Mini-Games:

Theoretical Definition: Games with flexible rules that provide a learning environment adapted to each individual's capacity—whether a child or an adult (Hanfi Mahmoud Mokhtar, p.135).

Operational Definition: Educational and recreational games designed to facilitate skill learning in a fun and engaging way, encouraging trainees to learn without boredom.

❖ Applied Section

I. Methodological Procedures

1. Pilot Study

To ensure the successful implementation of the field study, a preliminary pilot study was conducted. This step aimed to provide a general overview of the study context. We carried out a field visit to Khadija Umm Al-Mu'minin Secondary School in Batna, and after obtaining permission from the administration, we conducted a pilot trial involving 12 cadet-level volleyball players from the school sports team. The purpose of the pilot was to:

- Assess organizational aspects and the feasibility of skill test implementation.
- Confirm the suitability of equipment and tools used in the tests.
- Identify potential obstacles, errors, and operational overlaps.
- Verify the sample understands of the tests and the accuracy of their execution.

2. Research Method

According to **Touatah Mustafa (2022, p.116)**, methodology is “the conscious study of the different approaches applied by various sciences depending on the nature of their subjects”.

Given the nature of this study, the experimental method was deemed the most appropriate.

3. Study Population

The target population consisted of the school volleyball team at Khadija Umm Al-Mu'minin Secondary School in Batna.

4. Research Sample

The research sample included 12 male students from the school's volleyball team. They were purposefully selected based on their participation in an internal volleyball tournament organized among different classes.

5. Study Variables

Independent Variable: Mini-games training program

Dependent Variable: Basic volleyball skills (overhead and underhand passing)

6. Scope of the Study

- Temporal Scope: February to May 2025
- Spatial Scope: Khadija Umm Al-Mu'minin Secondary School – Batna
- Human Scope: School volleyball team members (cadet category)

7. Research Instruments

The study employed two skill-specific tests as tools for data collection (Bakri & Louh, 2020, p.164).

- ✓ Overhead Passing Test using a Wall
- ✓ Underhand Passing Test using a Target Ring

7.1. Overhead Passing Test (with Wall)

The player stands at a distance of 1.8 meters from the wall, then later at 3 meters, and performs repeated overhead passes against the wall.

7.2. Underhand Passing Test (Targeted Accuracy)

The player stands behind a designated red mark. If the underhand pass lands:

Inside the ring → 5 points

Inside the surrounding rectangle → 3 points

On the front edge of the rectangle → 1 point

7.3. Study Implementation Protocol

To ensure the proper execution of the study and the training program based on mini-games, the following protocol was adopted:

Preliminary Coordination:

Initial contact was made with Khadija Umm Al-Mu'minin Secondary School in Batna, and official authorization was obtained from the school administration to conduct the field study.

Participant Selection:

A purposive sample of 12 volleyball players (cadet category, ages 15–18) from the school sports team was selected following an internal mini-volleyball tournament.

Pre-Testing Phase:

- A pre-test was conducted to evaluate two fundamental volleyball skills:
- Overhead passing using the wall test at distances of 1.8 m and 3 m.
 - Underhand passing toward a target ring with scoring zones (5, 3, and 1 point).
 - The pre-test results established baseline performance data for each participant.

Intervention Phase (Training Program):

The proposed mini-games program was implemented over 12 training sessions.

Post-Testing Phase:

After completing the training program, a post-test identical in format and procedure to the pre-test was administered to measure progress in the same skills.

8. Psychometric Properties of Skill Tests

8.1. Reliability

To calculate test reliability, the test-retest method was used on February 25 and March 2, 2025, with 5 players from the pilot sample. Pearson’s correlation coefficient was applied to measure reliability.

8.2. Validity

The construct validity of the skill tests was assessed using the square root of the reliability coefficient.

Table (1): Psychometric Properties of the Skill Tests

Tests	Test		Retest		Reliability	Intrinsic Validity
	Arithmetic Mean	Standard Deviation (SD)	Arithmetic Mean	Standard Deviation (SD)		

Overhead Passing	17.17	5.53	17.67	4.93	0.97	0.98
Underhand Passing	46.50	13.22	47.33	12.88	0.99	0.99

These values indicate that both the reliability and validity of the tests are very high, confirming the suitability of the tools for this study.

9. Statistical Methods Used

- Arithmetic Mean
- Standard Deviation
- Shapiro-Wilk Normality Test
- Paired Samples t-Test

II. Results, Interpretation, and Discussion

1. Presentation and Interpretation of Results

1.1. Differences in Pre- and Post-Test Scores for Overhead Passing

To determine the nature of the differences between the pre- and post-test results for overhead passing among secondary-level school volleyball players, a paired samples t-test was used. The table below presents the findings:

Table (2): Differences in Overhead Passing Pre- and Post-Test Scores

test	Arithmetic Mean	Standard Deviation (SD)	t-value ((Calculated	Sig. (p)	Statistical Significance	Effect Size
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Pre-Test	9.58	2.27	8.30	0.000	Significant	0.51
Post-Test	24.92	5.81				

The table shows that the p-value (0.000) is less than the significance level (0.05), indicating a statistically significant difference in favor of the post-test. The improvement in the mean score (from 9.58 to 24.92) suggests that the training program had a positive and strong effect on the players’ overhead passing performance. The effect size was 0.51, which is considered large.

1.2. Differences in Pre- and Post-Test Scores for Underhand Passing

The same statistical procedure was used to assess the development in underhand passing skill:

Table (3): Differences in Underhand Passing Pre- and Post-Test Scores

test	Arithmetic Mean	Standard Deviation (SD)	t-value (Calculated)	Sig. (p)	Statistical Significance	Effect Size
Pre-Test	35.50	10.22	9.94	0.000	Significant	0.95
Post-Test	61.75	13.24				

The results again reveal a statistically significant improvement in underhand passing ($p = 0.000 < 0.05$), with a notable increase in the mean score from 35.50 to 61.75. The effect size was 0.95, which is very large, confirming the high impact of the proposed training program.

2. Discussion of Results

2.1. Discussion of Sub-Hypotheses

2.1.1. First Sub-Hypothesis:

“Mini-games positively affect the development of the overhead passing skill in volleyball for cadets aged 15–18”.

Based on the statistical results, this hypothesis is confirmed. The findings are consistent with those of **Cheqrani, Ben Sekran, and Meddahi (2015)**, who concluded that mini-games improve basic volleyball skills in the youth category (13–15 years old).

Additionally, the study by **Sadeq and Al-Ayadi (2016)** supported the effectiveness of mini-games in enhancing skill performance for high school volleyball players.

2.1.2. Second Sub-Hypothesis:

“Mini-games positively affect the development of the underhand passing skill in volleyball for cadets aged 15–18”.

This hypothesis is also confirmed, supported by the significant improvement in post-test scores. Again, the results are in line with **Cheqrani et al. (2015)** and **Sadeq and Al-Ayadi (2016)**, both of which emphasized the educational and developmental impact of mini-games in skill training.

Mini-games create an engaging and competitive environment that encourages players to participate actively. This reduces boredom and stress, fosters motivation, and accelerates skill development.

2.2. Discussion of the Main Hypothesis

The main hypothesis stated:

“The proposed mini-games program has a significant effect on the development of certain basic volleyball skills (overhead and underhand passing) for cadets aged 15–18”.

Given the results obtained and the large effect sizes, the hypothesis is accepted. The program's effectiveness is attributed to the diverse physical, physiological, cognitive, and psychological benefits of mini-games.

Mini-games also:

Enhance effective communication among players

Strengthen team cohesion and group dynamics, which directly improve skills like overhead and underhand passing

Promote learning through fun and low-pressure environments, stimulating intrinsic motivation

III. Conclusions and Recommendations

1. Conclusions

Based on the results obtained in this study, which assessed the impact of a proposed mini-games program on the development of certain basic volleyball skills (overhead and underhand passing) among cadets (ages 15–18), we conclude that the program was highly effective in:

- Improving the technical performance of the students
- Increasing their motivation to learn and practice
- Creating an engaging, interactive, and enjoyable training environment

The findings demonstrate that integrating mini-games into educational or training sessions achieves multiple objectives—physically, psychologically, and socially. Therefore, mini-games prove to be an effective pedagogical tool in the context of physical education and sports training, particularly for youth age groups.

2. Recommendations

In light of these conclusions, the study recommends the following:

Adoption of mini-games training programs in both educational and sports institutions, given their proven role in enhancing technical skills and overall performance.

Future research should extend to include additional volleyball skills or target different age groups to broaden the benefits and support the continued development of school-based sports education.

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