

## The Impact of Integrated Ball Training Using Plyometric Exercises on Developing Skill Performance for Youth Football Players Under 19 Years

أثر التدريب المدمج بالكرة باستخدام التمرينات البليومترية على تطوير الأداء المهاري للاعبين كرة القدم  
أواسط أقل من 19 سنة

Berrah hamza <sup>\*1</sup>,

<sup>1</sup> - University of Oum El-Bouaghi Larbi Ben M'Hidi etudiant\_hamza@yahoo.com

Received: 14/08/2023

Accepted: 27/02/2024

Published: 16 /03/2024

### Abstract:

The study aims to investigate the impact of an integrated ball training program using plyometric exercises on developing some fundamental skills of football (scoring, long passing, dribbling) among youth football players under 19 years of age in the state of Oum El-Bouaghi. The research was conducted by implementing a training program and controlled tests on a research sample selected by experts in the field, representing two youth teams: "U.S.C" Union Chaouia and "A.S.A" Association Ain M'lila, both competing in the second national division amateurs of the eastern region with 16 teams. The sample was chosen using purposive sampling method to ensure homogeneity and equivalence between the two groups.

The experimental approach was followed in the study, using validated skill tests as data collection tools. These tests were conducted before and after applying the integrated ball training program. The collected data were analyzed statistically using IBM SPSS Statistics 20 software. The paired and independent sample t-tests were employed to analyze the obtained results.

The results of the study confirmed the hypotheses, demonstrating post-measurement improvement in the experimental group's fundamental skills: scoring, long passing, and dribbling. This improvement was attributed to the implementation of the integrated ball training program using plyometric exercises.

**Keywords:** Integrated Ball Training, Plyometric Exercises, Fundamental Skills, Football

## Introduction:

In recent years, modern football has seen significant development in several aspects including physical, skill, tactical, and psychological dimensions. This evolution has led to a distinct style of play among teams and national squads, characterized by speed and precision in technical execution. Coaches have increasingly prioritized comprehensive player development during their formative years, employing well-designed scientific methods to enhance all aspects of play for competitive success (Muftee Ibrahim, 2010, p.103).

The process of skill development involves imparting essential abilities to players through exercises, knowledge, and information. The goal is to achieve accuracy and mastery in performance within the context of modern football. These skills are the essence of football performance and a common factor in players' execution (Akram Khataibeh, 2011, p.23).

Modern training methods have shifted towards structured programs that not only address skill development but also encompass physical, psychological, and tactical dimensions. Integrated training has become a popular approach to enhancing players' overall athletic excellence. This approach involves creating competitive scenarios within training exercises, demanding the integration of various skills and abilities required for actual match situations (Marion. A, 2000 p35).

The incorporation of plyometric exercises in physical preparation and training has become an essential addition. These exercises aim to develop and enhance both physical attributes and skill-related qualities, making them vital for success in sports, including football events (Berrah Hamza, 2019, p.84). Plyometric exercises are designed to directly elevate physical and skill performance levels (Zuhair Qasim Al-Khashab, 2009, p.45).

In the realm of football, the utilization of integrated physical preparation is commonplace, as it targets physical attributes such as strength and speed through skill-based exercises. Alexandre Dellal notes that this approach involves integrating the ball into physical exercises, allowing players to develop physical skill capabilities (Alexandre Dellal, 2008, p.65).

Moeen Abdel Karmi Hussam sees that the training programs are a measure of their success, based on the progress an individual athlete achieves in the quality of the practiced sports activity through skillful, functional, and physical levels. Football training stands out for its scientific planning, organization, and continuity, ensuring a positive impact on the player's level, ongoing development, and progress in various aspects of football. (Moeen Abdel Karmi Hussam, 2013, p. 100)

Many studies have indicated the effectiveness of integrated training on various physical aspects, such as the study by Daan Mohamed Al-Amin (2023), Ghaith Aloui and others (2022), another study in 2021, Firas Zghal and others in 2019, Barah in 2019, Masaliti Lkhedr in 2013, Barwak in 2021 and 2022, Sadoq in 2020, Barah in 2017, and Belfrites in 2019. These studies have shown positive impacts on physical aspects and skill performance, emphasizing the crucial importance of integrated physical training in football. Despite this, Algerian football has not yet reached the levels achieved by certain European nations, even at the amateur level. This discrepancy is particularly evident in physical and skill aspects, which fail to meet the desired standards. One contributing factor could be the lack of effective training programs. Recognizing the importance of structured programs rooted in scientific principles, the researcher conducted a study to propose an integrated physical training program incorporating plyometric exercises to enhance specific skill variables.

In light of this objective, a practical field study was conducted, employing a sound methodological approach to design a training program. The study considered loading principles and proper scheduling to ascertain the true impact of modern training methods,

## **Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years**

---

specifically integrated physical training involving plyometric exercises with the ball, on enhancing key fundamental skills such as scoring, long passing, and dribbling.

From this perspective, our research problem was formulated as follows: Does the proposed training program based on integrated physical training with the ball using plyometric exercises affect the improvement of some fundamental skills (scoring ability, long-passing skill, dribbling ability) among under-19 football players?

Subsidiary Questions: To confirm or refute the general question, it was necessary to break it down into subsidiary questions, which were formulated as follows:

- Does the proposed training program based on integrated physical training with the ball using plyometric exercises affect scoring ability?
- Does the proposed training program based on integrated physical training with the ball using plyometric exercises affect long-passing skill?
- Does the proposed training program based on integrated physical training with the ball using plyometric exercises affect dribbling ability?

General Hypothesis: The proposed training program based on integrated physical training with the ball using plyometric exercises affects the improvement of some fundamental skills (scoring ability, long-passing skill, dribbling ability) among under-19 football players.

Specific Hypotheses:

- The proposed training program based on integrated physical training with the ball using plyometric exercises affects the improvement of scoring ability.
- The proposed training program based on integrated physical training with the ball using plyometric exercises affects the improvement of long-passing skill.
- The proposed training program based on integrated physical training with the ball using plyometric exercises affects the improvement of dribbling ability.

Research Objectives:

- Determine the effect of the proposed training program based on integrated physical training with the ball using plyometric exercises on scoring ability.
- Determine the effect of the proposed training program based on integrated physical training with the ball using plyometric exercises on long-passing skill.
- Determine the effect of the proposed training program based on integrated physical training with the ball using plyometric exercises on dribbling ability.
- Identify the differences between pre-test and post-test scores in the level of some fundamental skills (scoring ability, long-passing skill, dribbling ability) among under-19 football players.

Importance of the Study:

- Highlight the importance of the proposed training program based on integrated physical training in enhancing some fundamental skills (scoring ability, long-passing skill, dribbling ability) among under-19 football players.
- Shed light on new alternatives for sports training programs in football, especially with the recent qualitative advancements, and reveal alternative solutions to link physical, skill, and tactical performance during the preparation stages.
- Open avenues for researching modern training methods and their impact on skill performance.
- Raise awareness among coaches about the significance of integrated physical training with plyometric exercises in developing skill attributes.
- Develop diverse modern training methods and strategies for load planning, intensity, and progression to enhance skill attributes.
- Bridge the gap between theoretical knowledge and practical application.

4- Definitions and Concepts:

**Corresponding author: berrah hamza , E-mail: etudiant\_hamza@yahoo.com**

#### 4.1 Integrated Training:

Integrated physical training refers to improving both physical and skill attributes through the specialized movements associated with the practiced activity, which enables athletes to reach a high level of performance (Frederic Lambertin, 2000, p. 09).

#### 4.2 Plyometric Training:

The term "plyometric training" simply refers to exercises involving jumps. It is a type of training that bridges the gap between strength and speed movements. Plyometric exercises are aimed at developing explosive muscle strength for a specific sport or athletic activity (Bahria Ibrahim Al-Shakri, 2009, p. 40).

#### 4.3 Scoring Ability:

Ferhat Jabbar defines scoring ability as the act of accurately and forcefully shooting the ball in a way that the goalkeeper cannot block it. There are various techniques for shooting, with the most suitable being the standard shooting technique. To execute it correctly, the player must ensure precision and strength (Ferhat Jabbar Saadallah, 2012, p. 206).

#### 4.4 Long-Passing Skill:

The term "long-passing" refers to the act of delivering the ball from one player to another to continue the attack or retain possession. This skill is extensively used in football matches. Passing is not limited to using the feet; it can also be executed using the head. It is used to advance towards the opponent's territory and requires accuracy in execution to deliver the ball to a teammate. The distance of such passes is typically beyond 25 meters (Mohammed Abu Youssef, 2005, p. 249).

#### 4.5 Dribbling with the Ball:

Dribbling with the ball involves moving with the ball towards the nearest open space ahead at the fastest pace possible while maintaining control. This skill aims to advance towards the opponent's territory. Dribbling's difficulty lies in executing it accurately and delivering it to a teammate. It is performed with the intention of progressing towards the opponent's side (Ghazi Mohammed Housseem Saleh, 2013, p. 34).

These definitions and concepts provide a foundation for understanding the key terms and ideas used in your research study. They help establish a common understanding of the terminology used throughout your research.

### 5- Previous and Similar Studies:

5-1Ghaith Aloui Combined Plyometric and Short Sprint Training in U-15 Male Soccer Players: Effects on Measures of Jump, Speed, Change of Direction, Repeated Sprint, and Balance (Ghaith Aloui and others 2022)

Ghaith Aloui and team conducted an 8-week study on male youth soccer players (<15 years) using biweekly combined plyometric and short sprint training. The experimental group showed significant improvements in jump, sprint, change-of-direction ability, repeated sprints, and dynamic balance compared to the control group. This suggests that incorporating such training enhances the athletic performance of young male soccer players.

5-2Ghaith Aloui and others(2021) Effects of Combined Plyometric and Short Sprints Training on Athletic Performance of Male U19 Soccer Players (Ghaith Aloui and others 2021)

This study by Ghaith Aloui et al. investigated the impact of an 8-week biweekly plyometric and short sprint training program on male youth soccer players. The experimental group showed significant improvements in jump, sprint, change-of-direction, repeated sprint

## **Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years**

---

ability, and dynamic balance compared to the control group, suggesting enhanced athletic performance with this training.

5-3 Firas Zghal and others (2019) Combined Resistance and Plyometric Training Is More Effective Than Plyometric Training Alone for Improving Physical Fitness of Pubertal Soccer Players (Firas Zghal and others 2019)

The study compares combined resistance training with plyometric/sprint training to plyometric/sprint training alone or standard soccer training in young players. Results show that combined training enhances muscle strength, sprinting, and jumping more than plyometric/sprint training alone or standard soccer training.

5.4 A study by Berouague Hassane in 2022 titled "The Impact of Integrated Training on Developing Dribbling Skills for Football Juniors (9-12) Years in Oum el-Bouaghi Clubs" aimed to investigate the impact of integrated training on developing dribbling skills for football juniors. The study concluded that the proposed integrated training program had a positive impact on developing dribbling skills in young football players (Berouague Hassane, 2022).

5.2 Another study by Berouague Hassane in 2021, titled "The Impact of Integrated Training on Developing Long-Passing and Dribbling Skills in Football Juniors (9-12) Years in Oum el-Bouaghi Clubs," explored the effect of integrated training on developing long-passing and dribbling skills. The study suggested that integrated training had a positive effect on enhancing these skills in young football players (Berouague Hassane 2021).

5.3 A study by Sedouk Hamza in 2020 titled "Effectiveness of Integrated Training during General and Specific Preparation Periods on Developing Skill Performance in Football Juniors Under 19 Years Old" aimed to reveal the effectiveness of integrated training on developing basic skill performance in football players. The study found positive effects on controlling the ball in a defined space, passing and receiving, and shooting accuracy (Serdouk Hamza, 2020).

5.4 A study by Belferits Yassine in 2019 titled "The Impact of a Proposed Integrated Training Program on Improving Performance of Some Basic Skills (Passing, Shooting Accuracy, Dribbling) for Football Players Under 19 Years Old" investigated the impact of an integrated training program on improving skills such as passing, shooting accuracy, and dribbling. The study showed that the proposed training program had a positive effect on enhancing these skills in young football players (Belferits Yassine, 2019).

These previous studies are relevant to your research topic and provide insights into the impact of integrated training on developing various football skills among young players. They contribute to the existing knowledge and can serve as references to support your research findings and conclusions.

5-5 study by Hamza Berrah, conducted in 2017, aimed to investigate the impact of certain plyometric exercises on developing explosive strength, speed-strength, and fundamental soccer skills for male players. The study was conducted with the use of a training methodology that combined repetitive and high-intensity periodic training with plyometric techniques. The research was published in the "Challenge Zone" of the University of Oum El Bouaghi.

**Corresponding author: berrah hamza , E-mail: etudiant\_hamza@yahoo.com**

-Publication rights are reserved for Oum-El Bouaghi University - website: <https://www.asjp.cerist.dz/en/PresentationRevue/71>

The participants were amateur football players aged 19 (youth) from both USC and USMAB teams, totaling 16 teams in 2018. The sample selection was deliberate, and preliminary tests were performed on 24 players from USC as the experimental group and 24 players from USMAB as the control group. Statistical analysis was conducted using SPSS. The study concluded that there were statistically significant differences in explosive strength, speed-strength, and basic soccer skills for male players, favoring the experimental group's post-tests. (Hamza berrah 2017)

### **6-Commentary on Previous Studies:**

The researcher reviewed studies conducted between 2017 and 2022. Key observations from these studies include:

1. Objectives: Many previous studies aimed to design and assess the impact of integrated training programs involving soccer on fundamental skills among football players.
2. Methodology: Most previous studies aligned in employing an experimental methodology, either single-group pretest-posttest or two-group designs.
3. Statistical Analysis: The statistical methods used in previous studies were similar to those employed in the current research, with many studies utilizing the Student's t-test.
4. Results: A common finding in the reviewed studies was the positive influence of integrated physical training with soccer on various soccer-related attributes.

### **Utilizing Insights from Previous Studies:**

The insights from previous studies have several applications, including:

- Identifying appropriate methodologies such as using experimental designs with experimental and control groups and conducting pretest-posttest measurements.
- Recognizing essential assessment methods for measuring soccer players' skills.
- Defining the procedural steps for study execution, both technically and administratively.
- Crafting effective training programs.
- Drawing upon the findings of prior research to interpret and corroborate the current study's outcomes.
- **Methodological Procedures:**
- **7-1 Survey Experiments:** Issa Soubhi defines a survey experiment as "a preliminary experimental study conducted by the researcher on a small sample before conducting the main study in order to select research methods and tools." (Issa Soubhi, 2007, p. 71). Considering the availability of numerous candidate tests with specific scientific conditions and specifications, and in light of the study's problem and objectives, the

## Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years

---

researcher conducted two survey experiments to ensure the application of these tests in their final form:

- The first survey experiment aimed to:
  - Familiarize the assisting team with the tests and their application methods.
  - Verify the validity and safety of the assisting tools and devices used in the tests.
- The second survey experiment was carried out on August 20, 2021, and repeated on August 27, 2021, involving a random sample of USC members. The objective was to establish the reliability and stability coefficients of the tests, assess their difficulty level, and determine their suitability for the research sample. The researcher conducted the tests on the primary experimental group.
- **7-2 Study Methodology:** The nature of the studied phenomenon determines the research methodology, as the value of results depends on the value of the methodologies employed. (Maurice J. N. Angrist, 2004, p. 97). The researcher utilized the experimental methodology with two groups: an experimental group and a control group.
- **7-3 Study Population:** The study population consisted of amateur football players aged 19 (youth) from 16 teams, based on the statistics for football in the 2021/2022 season.
- **7-4 Study Sample:** The sample is a subset of the entire phenomenon, used as the basis for estimating the entire population that is difficult or impossible to study comprehensively due to factors related to the phenomenon's reality, cost, or time. The researcher deliberately selected a sample, which included the USC football team as the experimental group and Ain M'lila Union team as the control group. For the survey experiment, the researcher chose the USC team to conduct and re-conduct the tests during the player selection period.
- **7-5 Control of Research Variables:**
  - The independent variable: The proposed training program integrating soccer and based on plyometric training.
  - Dependent variables: Scoring skill, long passing skill, dribbling skill.
  - Extraneous variables: These are variables that do not enter the research design and are beyond the researcher's control but impact the research results undesirably. The researcher took measures to control these factors, including:
    - Conducting pre-test and post-test measurements under the same conditions.
    - Personally supervising the study with the assistance of the team.
    - Ensuring both groups were of the same age (youth) and had similar training experience (over 4 years).

Corresponding author: berrah hamza , E-mail: etudiant\_hamza@yahoo.com

- Coordinating with coaches for training, as well as directly supervising the experimental group's training sessions using the proposed integrated training program with plyometric exercises and traditional training for the control group.
- **7-6 Training Program:** After analyzing content from studies and scientific sources, the researcher designed a training program based on scientific foundations. The program was reviewed by experts in sports training and soccer. The necessary modifications were made to finalize the program. The researcher considered individual differences, progression, optimal workload-to-rest ratio, warm-up routines, and plyometric exercises. The training program included:

The training program for the experimental group consists of an 8-week preparatory phase with two mesocycles, each comprising three microcycles. This includes both the general and specific physical preparation phases. The load movement ratio (1:2) was used in the general preparation phase, and a mesocycle with two microcycles using a load movement ratio of (1:1) in the pre-competition phase.

**General Physical Preparation Phase (3 weeks):**

Two training units using integrated plyometric training with the ball.

**Specific Physical Preparation Phase (3 weeks):**

Three training units using integrated plyometric training with the ball.

**Pre-Competition Phase (2 weeks):**

Two training units using integrated plyometric training with the ball.

**Training Methodology:** The training methodology employed in the training program includes repetitive training and high-intensity interval training using integrated plyometric training with the ball.

**Load Movement Ratio (1:2):** A load movement ratio of 1:2 was employed.

**Difficulty Levels for Plyometric Exercises in the Program:**

- **Simple or Low Difficulty Plyometrics (20 cm):** Exercises with a simple or low difficulty level involve a height of 20 cm.
- **Moderate Difficulty Plyometrics (30-70 cm):** Exercises with a moderate difficulty level range from 30 to 70 cm in height.
- **High or Intense Difficulty Plyometrics (70-100 cm):** Exercises with a high or intense difficulty level require working at heights ranging from 70 to 100 cm.

**Classification of Plyometric Exercises Based on Intensity:**

- **Exercises with Low Intensity:** These include jumps between markers, planks, and frames.
- **Exercises with Moderate Intensity:** These involve jumping over hurdles, benches, and platforms.
- **Exercises with High Intensity:** These include high planks (Plinthes haut) and similar activities.

**Control Over Three Types of Criteria:**

**Change in Transition Form:**

**In Place:** No change in location.

**Simple Transition:** Basic movement from one point to another.

**Considerable Transition:** More complex movement involving significant changes.

Performance of Exercises with Multiple Movements:

**Progression Lunges:** Forward lunges.

Squat Movement (1/2 or Full): Squatting movements either halfway or full range.

## Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years

Regular Lunges: Standard lunges.

### Consideration of Execution Pace:

Emphasis on Capacity: Prioritizing power or strength.

Emphasis on Frequency: Prioritizing the frequency or rate of execution.

(Gilles Cometti, , 2002, P P110-111)

### Defining the Three Fundamentals of Plyometrics:

#### 1. Positioning (Le placement):

- Involves altering the positioning of the knee at different angles during the jump.
- The athlete falls from above a platform with extended legs, then descends to a position where the knee is flexed to a 90° angle.

#### 2. Movement (Le déplacement):

- Encompasses changing angles during movement, either by increasing speed or expanding the range of motion without altering the angle of contraction.

#### 3. Muscle Tension Quality (Le caractère des tensions musculaires):

- Involves changing the positioning of the knee at different angles during the jump

**The load of distinctive strength development integrated with ball speed used in the program:**

Difficulty Levels of Plyometric Exercises	Intensity Used	Repetitions	Sets	Recovery	Rest
High or Intense	80%	6	3	1'15"	4'
Moderate	75%	8	4	1'	3'
Low or Weak	70%	10	5	45"	2'

**Load for Integrated Explosive Strength Development with Ball Used in the Program:**

Level	Intensity Used	Repetitions	Sets	Recovery	Rest
High or Intense	90%	3	4	2'	3'
Moderate	85%	4	5	1'30"	2'30"
Low or Weak	80%	5	6	1'	2'

### Calculating Intensity in the Program:

Considering that the experimental sample age ranges between 17-18 years:

#### 1. Maximum Heart Rate (MHR):

- $MHR = 220 - 18$
- $MHR = 202$  beats/min
- Reserve MHR = 202 - 65
- Reserve MHR = 137 beats/min

#### 2. Target Heart Rate (THR):

- $THR = (\text{Reserve MHR} * \text{Target Heart Rate Percentage}) + \text{Resting Heart Rate}$
- For working on explosive strength in the range of 70%-80%:
  - Level 01:  $THR = 137 \text{ beats/min} * 70\% + 65 \text{ beats/min} = 161$  beats/min
  - Level 02:  $THR = 133 \text{ beats/min} * 70\% + 69 \text{ beats/min} = 162$  beats/min
  - Level 03:  $THR = 128 \text{ beats/min} * 70\% + 74 \text{ beats/min} = 164$  beats/min

Corresponding author: berrah hamza , E-mail: etudiant\_hamza@yahoo.com

Expected Time=Intensity of the Desired Session(Maximum Intensity×Achievement Time)

example: Session 01 for Speed-Specific Power

- 8 round-trip jumps on a ladder with tied legs
- A quick start for 10 meters
- Shooting at a large goal after receiving the ball from a teammate and bypassing passive defenders.

This is done through a single-leg jump test covering a distance of 30 meters for speed-specific power. The researcher calculated the mean for the right and left legs, resulting in a range of 7 to 9 seconds.

At the beginning of each training session, players were selected based on the number of workshops or exercises, aiming to provide an illustrative example for the workshop.

To calculate the expected time:

- Expected time = (Maximum intensity 100% x 10 seconds) / 70%
- Expected time = 14 seconds

Considering individual differences among players, the performance range was found to be between 14 and 16 seconds.

- **7-7 Tools Used:** Jump rope (20), ground ladder (05, 10m each), soccer ball (16), hurdle set (04, height 1.5m), small goal (04), medicine balls (10, 2-3 kg each), hurdles (16, different heights 30-70cm), cones (30, different heights 20-50cm), benches and platforms (10, different heights 50-100cm), circular rings (20), discs (50).
- **7-8 Research Fields:**
- Human Field: The study involved amateur football players aged 19 (youth) from 16 teams, with the research sample consisting of USC and Ain M'lila Union teams. For the survey experiment, the USC team was selected, involving 08 players.
- Spatial Field: The study was conducted in the Zerdani Hasuna Municipal Stadium and the Brothers Daman Dabaih Stadium in Ain M'lila.
- Temporal Field:
- Phase 1: Completion of the survey experiment on August 20, 2021.
- Phase 2: Implementation of the primary experiment from September 1, 2021, to October 31, 2021.

Table (01): Illustrates the schedule for conducting programmed tests during the implementation of pre-test and post-test assessments.

Pre-test Tests (Long-range shooting, dribbling) Union Chaouia Team 08/30/2021

Ain M'lila Association Team 08/31/2021 6:00 PM - 7:30 PM

Post-test Tests (Long-range shooting, dribbling) Union Chaouia Team 11/01/2021

Ain M'lila Association Team 11/02/2021 6:00 PM - 7:30 PM

7-9 Data Collection Tools and Methods: The researcher employed the following tools and methods:

**7-9-1 Arabic and Foreign Sources, Journals, Theses:** This was accomplished through theoretical readings, content analysis of specialized scientific references in the field of evaluation, and reliance on previous studies within and outside the Arab and foreign countries related to the evaluation process in general. This also included the evaluation of players' skill aspects and the development of training programs.

**7-9-2 Skill Tests and Measurements:** The researcher relied on a set of standardized tests to measure the skill aspect in football. These tests were appropriate for the stated objectives, discussed and presented to experts specializing in training in general and football in particular. Their agreement was obtained, and the tests will be presented later.

## **Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years**

---

7-9-3 Survey Form for Experts in Sports Education and Training: A survey form was used to gather opinions from experts in the field of training to nominate and select the most important skill tests after making necessary adjustments.

Determination of Skill Tests: To determine the skill tests (shooting, long-range passing, dribbling), the researcher designed a form based on sources, scientific references, and previous studies. This form was presented to several experts and specialists both nationally and internationally. After collecting the forms and analyzing the data based on repetition rates and percentages, all elements and tests that received approval from more than 75% of the experts were included. This was in accordance with the opinions of 15 experts and specialists in training and football. According to Mohammed Hassan Alawi and Nasser Al-Din Radwan, "The researcher must obtain approval by 75% or more of the experts' opinions. Any component or specific skill that receives repetition rates less than 25% of the total opinions should be excluded from the intended experiment." (Mohammed Hassan Alawi, Mohammed Nasser Al-Din Radwan, 2008, p. 329)

### **7-10 Tests Used in the Research:**

#### **7-10-1 Shooting Test:**

A- Test Objective: Measure the player's strength and accuracy in shooting towards the goal.

B- Field and Equipment: Football field divided into 5 equal sections by lines falling from the goalpost and fixed to the ground. 5 footballs placed in a straight line, 25 meters away from the goal.

C- Test Procedure: The player shoots the first ball towards the first section on the right side of the goal and the second ball towards the second section of the goal, and so on in sequence.

D- Scoring: A point is awarded for each accurate shot. Shots that miss the intended section are not counted. (Rissan Majid Khreibt, 1988, p. 92)

#### **7-10-2 Long-Range Kicking Test:**

A- Test Objective: Measure the strength of kicking the ball by covering the longest possible distance. Also, assess the ability for long and accurate passes.

B- Test Specifications: The ball is placed in the center of the circle at the middle of the field. The player runs with the ball to the first line and then kicks the ball with maximum force towards the goal (without a goalkeeper).

C- Scoring: Points are given as follows:

10 accurate kicks = 5 points    09 accurate kicks = 4.5 points    08 accurate kicks = 4 points

07 accurate kicks = 3.5 points    06 accurate kicks = 3 points    05 accurate kicks = 2.5

points    04 accurate kicks = 2 points    03 accurate kicks = 1.5 points

D- Equipment Used: Measuring tape, 10 footballs.

The player performs 10 attempts in 5 seconds. The player performs 5 kicks with the right foot, 5 kicks with the left foot. The ball is allowed to bounce once.

The distance is 40 meters from the first line, 30 meters from the second line. (Youssef Lazem Kamash, 2013, pp. 287-288)

7-10-3 Dribbling Skill Test: Test Objective: Measure the ability of football players to dribble.

Performance Steps: The player stands with the ball at the finish line, and at a distance of 5 meters, there are 6 cones with a 1-meter distance between each cone. Upon the whistle, the player runs with the ball for 5 meters, passes through the cones using different parts of the foot while maintaining control over the ball without touching the cones. After passing the last cone, the player runs with the ball at maximum speed and returns to the

finish line (the same starting line). The player's score is calculated in seconds and fractions of a second. (Laidi Abdelrahim and others, 2023, p. 7)

**Table No. 02 represents the stability calculation for skill tests.**

R	Second application		First application		Skill Test
	Deviation	Average	Deviation	Average	
0.755	0,5	1,75	0,28	1,5	Scoring test
0.654	0,21	1,25	0,12	1,12	Shooting test
0.790	0,18	10,64	0,31	10,75	Dribbling skill test

**Table No. 03 represents the calculation of the subjective validity coefficient for skill tests.**

Significance Level	Degrees of Freedom (n-1)	Critical Correlation Coefficient	Self Reliability Coefficient	Stability Coefficient	Measurement Unit	Skill Tests
0.05	7	0.666	0.868	0.755	Grades	Scoring Ability Test
			0.808	0.654	meters	Ball Kicking Test
			0.888	0.790	Time	Dribbling Skill Test

**Truthfulness:**

The reliability coefficient is considered one of the important scientific criteria. A reliable test is one that accurately measures the phenomenon it is designed to assess (**Mohammed Hassan Alawi, Mohammed Nasr al-Din 2000, p. 255**).

The study incorporated tests with established reliability, and additional measures, "content reliability" and "self-reliability," were introduced. Content reliability involved expert evaluation and refinement based on feedback. Self-reliability was established by calculating the square root of the stability coefficient. This meticulous approach aimed to enhance overall reliability and validity. The equation used to calculate self-reliability is as follows: Self-reliability = Stability  $\sqrt{\phantom{x}}$ . (**Ridwan Mohammed Nasr al-Din, 2011, p. 216**)

**Objectivity:**

The objectivity of the test means "excluding personal factors from the judgments made by the researcher and freeing oneself from bias or prejudice" (**Abdul Rahman Mohammed Issawi, 2003, p. 332**)

**.Statistical Analysis:**

For processing the data and addressing the study's questions, the researcher utilized the Statistical Package for the Social Sciences (SPSS) software. This was done to obtain the following statistical analysis results: mean, standard deviation, variance, t-test, Pearson correlation coefficient, progress ratio, and percentage ratios.

**8Results Analysis and Discussion:**

After conducting preliminary tests on the research samples (experimental and control), and based on the obtained results, the researcher examined the homogeneity of the two samples using the t-test. This process yielded the following results:

**Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years**

Table 4: Illustrates the homogeneity of the research samples in variables (age, height, weight, training age).<sup>2</sup>

Alpha Value	Degrees of Freedom (2(N-1))	Calculated T-value	Critical T-value	Control Group		Experimental Group		Variables
				y	x	y	x	
0.05	34	0,33	1,69	0,25	17,38	0,23	17,33	Age
		,261		0.01	175	0.01	173	Height (cm)
		1.46		17.08	63.44	39,82	66,05	Weight (kg)
		0,85		2,02	4,83	0,73	4,5	Training Age (years)

Through Table 4, which illustrates the homogeneity of the research samples in variables (age, height, weight, training age), the following becomes evident:

Since the calculated t-values for variables (age, height, weight, training age) are respectively (0.33, 1.26, 1.46, 0.85), which are lower than the critical t-value estimated at 1.69 for a 0.05 error margin, there are no statistically significant differences between the control sample and the experimental sample. Therefore, it can be concluded that the two groups are homogeneous.

**-2 Presentation and Analysis of the Results of the Skill Tests for the Experimental and Control Groups in the Pre-test:**

Table No. (05): Illustrates the pre-test results for the experimental and control groups.

Tests	Experimental Group (M ± SD)	Control Group (M ± SD)	t-Calculated	Statistical Significance
Pré-test: Shooting test	1.16 ± 0.14	1.05 ± 0.05	1.04	Not Significant
Pre-test: Kicking for Distance	1.05 ± 0.05	1.00 ± 0.11	0.56	Not Significant
Pre-test: Dribbling	10.26 ± 0.54	10.43 ± 0.15	0.88	Not Significant

At a significance level of 0.05 and with 34 degrees of freedom, the critical t-value from the table is 1.69.

Table 5 presents the pre-test results for the research sample in goal shooting, kicking for distance, and dribbling. Upon analyzing the table, the following observations are made:

The experimental group obtained pre-test mean scores of (10.26, 1.05, 1.16) with standard deviations of (0.54, 0.05, 0.14) for goal shooting, kicking for distance, and dribbling, respectively. On the other hand, the control group obtained pre-test mean scores of (10.43, 1.00, 1.05) with standard deviations of (0.15, 0.11, 0.05). The calculated t-values for the respective tests were (0.88, 0.56, 1.04), all of which are lower than the critical t-value of 1.69. This indicates that there are no statistically significant differences between the two research groups in the pre-test assessments, confirming the equivalence of the two groups before the intervention.

**8-3 Presentation and Analysis of the Post-Test Motor Skills Results for the Experimental and Control Samples:**

**Table 6** illustrates the post-test results for the research sample in goal shooting, kicking for distance, and dribbling.

Statistical Significance	T Calculat	Post test		Pré-test		Tests	
		y	x	y	x		
Significant	3,82	0,33	1,72	0,14	1,16	Goal Shooting	Experimental Group
	1,84	0,18	1,22	0,05	1,05		Control Group
Significant	4,60	0,25	1,61	0,05	1,05	Kicking for Distance	Experimental Group
	2,2	0,18	1,22	0,11	1		Control Group
Significant	3,88	0,35	9,94	0,54	10,26	Dribbling	Experimental Group
	2,08	0,14	10,36	0,15	10,43		Control Group

The provided text describes the results of a proposed training program compared to a control group, with reference to a significance level of **0.05** and a degrees of freedom of **17**. Here's the translation:

"At a significance level of **0.05** and with **17** degrees of freedom, the critical t-value from the table is **1.74**.

**Table number (06)** illustrates the superiority of the effect of the proposed training program. The control group had pre-test mean values of (**10.43, 1, 1.05**) and standard deviation values of (**0.15, 0.11, 0.05**). The post-test mean values were (**10.36, 1.22, 1.22**) with standard deviation values of (**0.14, 0.18, 0.18**).

As for the experimental group, the pre-test mean values were (**10.26, 1.05, 1.16**) with standard deviation values of (**0.15, 0.05, 0.14**). The post-test mean values were (**9.94, 1.61, 1.72**) with standard deviation values of (**0.35, 0.25, 0.33**). The calculated t-values were (**1.84, 3.82**) for the scoring test, (**2.2, 4.60**) for the ball kicking test, and (**2.08, 3.88**) for the dribbling test. These calculated t-values are greater than the critical t-value of **1.74** from the table, at a significance level of **0.05** and degrees of freedom of **17**. This clearly confirms the superiority of the proposed training program over the regular program."

**"8-4 Presentation and Analysis of the Results of the Skill Tests for the Control and Experimental Samples in the Post-Test:**

To determine the superiority of the impact of the proposed training program over the regular program, the researcher used an independent samples t-test in the post-test, as illustrated in Table (07).

**Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years**

Table (07) presents the results of the post-test for the research samples in the Shooting Test, Farthest Distance Ball Kicking Test, and Dribbling Test.

Statistical Significance	T Calculat	Control Group		Experimental Group		Tests	
		y	x	y	x		
Significant	2,56	0,18	1,22	0,33	1,72	Goal Shooting	Post test
Significant	2,07	0,18	1,22	0,25	1,61	Kicking for Distance	
Significant	2,52	0,14	10,36	0,35	9,94	Dribbling	

"At a significance level of 0.05 and with 34 degrees of freedom, the critical t-value from the table is 1.69.

**Table number (07)** illustrates the superiority of the impact of the proposed training program. The control group had post-test mean values of **(10.36, 1.22, 1.22)** with standard deviation values of **(0.14, 0.18, 0.18)**. In contrast, the experimental group had post-test mean values of **(9.94, 1.61, 1.72)** with standard deviation values of **(0.35, 0.25, 0.33)**. The calculated t-values were **(2.52, 2.07, 2.56)**, which are greater than the critical t-value of **1.69** from the table, at a significance level of **0.05** and degrees of freedom 34.

Furthermore, the improvement ratio in the control group was (0.67, 22, 16.19%), while in the experimental group, it was **(3.11, 53.33, 48.27%)**. This clearly confirms the superiority of the proposed training program over the regular program."

#### **8-4 Discussion and Results Comparison with Hypotheses:**

##### **8-4-1 Discussion of Results Related to the First Hypothesis:**

The proposed training program, based on integrated physical training with the ball using plyometric exercises, has an impact on the skill of shooting.

The researcher attributes the observed improvement in shooting skill in the dimensional measurement for the experimental group compared to the control group to the effectiveness of exercises aimed at enhancing this skill. Additionally, the training program includes physical skill exercises that contribute to diverse skill improvement. Diaa suggests that diversity in training, incorporating more than one skill in a single exercise, contributes to the development of various skill traits **(Diaa Naji Yaqoub, 2003, p.52)**.

. In this context, Majadi Fatah adds that it is crucial to rely on sports training science in selecting exercises and determining modern methods and techniques used in implementing training programs **(Majadi Fatah et al., 2019, p. 405)**.

Mishal Adi Al-Damri believes that shooting at the goal is considered one of the fundamental aspects of the game of football. To reach an advanced stage of mastery in the game, a player must achieve proficiency in the skill of shooting from various areas on the field, whether using the feet or the head. This involves scoring goals with strength and precision in the opponent's goal. **(Mishal Adi Al-Damri, 2013, p. 242)**

The researcher attributes this improvement to visual calculations, the breadth of vision, and the player's motor intelligence. Daan Abdel Moumen also believes that ball-integrated exercises significantly contribute to the continuity of training. This ensures that the player approaches the exercise with enthusiasm, repeating it multiple times without feeling bored (**Daan Abdel Moumen, Amzian Osama, 2023, p. 13**).

The current study aligns with the findings of studies conducted by **Sadoq (2020), Berrah (2019), and Belfritees (2019)**. All of these studies unanimously concluded on the positive impact on shooting skills.

The current study is also in agreement with the research conducted by **Ghaith Alawi and others in 2022**. The study indicates that plyometric training contributes to enhancing the athletic performance of young football players.

#### **8-4-2 Discussion of Results Related to the Second Hypothesis:**

he proposed training program, based on integrated physical training with the ball using plyometric exercises, has an impact on the skill of long passing.

The observed differences in long passing skills are attributed to the well-organized and sequenced implementation of the program units. The researcher emphasizes the use of scientifically grounded training methods, consideration of individual differences, and the continuous progression of training, all contributing significantly to the improvement of long passing skills.

The researcher believes that mastering technical skills, such as passing, enables the application of direct and fast-paced play, placing players in situations that allow them to maintain possession based on the opponent's positioning, thereby linking it to time management.

The researcher highlights that achieving long-distance ball striking requires coordination among leg, trunk, and arm muscles for optimal performance. Al-Nu'man emphasizes the need for substantial muscle strength to exert maximum force, enabling players to cover extensive distances when striking the ball (**Al-Nu'man Ali Zuhair Saleh, 2005, pp. 55-56**).

The researcher emphasizes that achieving long-distance ball striking requires trunk muscle flexibility. Integrated ball and plyometric exercises increased body muscle flexibility, relying on stretching and contracting movements, leading to superior long-distance ball striking compared to regular training.

he current study aligns with the findings of the study by **Barwak in 2021**, indicating a positive impact on the development of long passing skills in football.

The study is also consistent with the findings of both **Berrah (2019) and Belfritees (2019)**, where the results of both studies demonstrated an improvement in passing performance among youth football players.

The study is in line with the research conducted by **Feras Zghal and others in 2019**, where it is shown that combined resistance and plyometric training better enhance muscle strength, running, and jumping performance in young football players.

#### **8-4-3 Discussion of Results Related to the Third Hypothesis:**

he proposed training program, based on integrated physical training with the ball using plyometric exercises, has an impact on dribbling skills.

## Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years

---

he researcher explains that dribbling skills require players to perform the skill quickly and accurately, with the ability to change direction smoothly and with agility. This involves coordination between arm and leg movements while maintaining continuous control of the ball with both feet.

Makaruk, H., 2020, suggests that using specific plyometric and short sprint training protocols as additions to regular football training enhances strength-related measures such as running and jumping performance, which are associated with football performance (**Makaruk, H., 2020, p. 348**).

The researcher highlights that integrated ball training with plyometric exercises enhances coordination between leg and arm movements. This involves ascending and descending from boxes and climbing stands, requiring players to perform movements and swing their arms using the ball. This harmonizes arm and leg actions, positively impacting rolling skills. Integrated training with plyometrics also improves performance time, relying on high-speed muscle contraction for better correlation between action and quick reaction, crucial for ball control during rolling.

he Sufi indicates that plyometric exercises work to reduce performance time by enhancing speed and strength. The distinctive strength combined with speed is crucial for players while performing ball exercises and changing directions at any given moment (**Al-Soufi, Anad Gerges, 1999, p.55**).

Abdul Sattar Al-Dabagh believes that a skilled player is one who possesses excellent physical abilities, including muscular strength, as a fundamental quality that qualifies them to perform various skills to the fullest extent (**Al-Dabagh, Anmar Abdul Sattar, 2009, p.71**).

The researcher observes that most players lose the effective impact in executing skills in the absence of physical preparation, leading them to enhance their physical fitness levels. Hammad emphasizes that good performance extends beyond basic skill execution; there are specific requirements influencing artistic performance. Therefore, these requirements include components of physical fitness contributing to the optimal presentation of performance (**Mufti Ibrahim Hammad, 2001, p.29**).

Canavanpk emphasizes that the technical, tactical, and psychological aspects are directly influenced by physical attributes (**Canavanpk, 2004, p.158**). Additionally, Dellal Alexandre mentions that football is a multifactorial game, requiring players to possess technical, tactical, physical, and mental abilities that interact with each other (**Dellal Alexandre, 2013, p.3**). Jean-Paul Antian believes that it is entirely impossible to isolate the dominance of the physical aspect from the other aspects, as it is in constant interaction with them (**Jean-Luc Cayla, Rémy Lacrampe, 2007, p.30**).

Sabr Qasim indicates that the performance level of a skill depends on training in those skills as well as physical readiness for the desired skill acquisition (**Sabr Qasim et al., 2005, p.75**). The current study aligns with the findings of studies conducted by **Barwaq in 2022 and 2021**, all indicating the development of dribbling skills through integrated training methods among young football players.

The studies by **Berrah in 2017 and 2019** emphasize the significant importance of integrating physical and skill aspects during training sessions.

Additionally, it aligns with the study conducted by **Ghaith Alawi and others in 2021**, indicating that combined plyometric and short-distance running training contributes to

improvements in jumping performance, running ability, direction-changing skills, repeated sprint ability, and dynamic balance among young football players under 19 years old.

### **9- Conclusions and Recommendations:**

In light of the test results, their analysis, and discussion, the following conclusions have been drawn:

- The proposed training program, integrating ball training using plyometric methods, has a positive impact on improving the shooting skill in youth football players.
- The proposed training program, integrating ball training using plyometric methods, has a positive impact on improving the long passing skill in youth football players.
- The proposed training program, integrating ball training using plyometric methods, has a positive impact on improving the dribbling skill in youth football players.

### **Recommendations:**

- Emphasize the importance of integrating physical and skill aspects during training sessions.
- Utilize integrated physical training with the ball, incorporating plyometric exercises that address both physical and skill aspects, in training youth football players.
- Highlight the necessity of diversifying training methods and incorporating modern techniques for training fundamental skills based on scientific principles.
- Prioritize the use of scientific tests and measurements before implementing training programs to account for individual differences.
- Conduct studies on the impact of integrated physical training with the ball on physical attributes.
- Conduct similar studies and research on other samples.

### **10- List of Sources and References Used in the Study:**

#### **Books:**

1. Akram Khataibia: "Foundations and Programs of Physical Education," 1st ed., Dar Al-Yazawi Scientific Publishing and Distribution, Amman, Jordan, 2011.
2. Bahria Ibrahim Al-Shukri, Muhammad Jabir Bariqah: "Plyometric Training for Young Athletes," Vol. 2, Manshuaeat Al-Ma'arif, Alexandria, 2009.
4. Radwan Muhammad Nasr Al-Din: "Introduction to Measurement in Physical Education and Sports," 2nd ed., Dar Al-Fikr Al-Arabi, Cairo, Egypt, 2011.
5. Risan Majid Kheraybat: "Encyclopedia of Measurements and Tests in Physical Education and Sports," University of Basra, 1988.
6. Sabr Qasim et al.: "Foundations of Learning and Teaching and Their Applications in Football," University Press, Baghdad, 2005.
7. Abd Al-Rahman Muhammad 'Isawi: "Psychological Tests and Measurements," Manshuat Al-Ma'arif, Alexandria, 2003.
8. Ghazi Saleh Mahmud: "Scientific and Applied Foundations of Football," 1st ed., Arab Community Library, Amman, Jordan, 2013.
9. Ghazi Muhammad Hasim Saleh, Mahmud Hashim Yaser: "Comprehensive Reference in Football," 1st ed., Arab Community Library for Publishing and Distribution, Jordan, 2013.
10. Farhat Jabbar Sa'd Allah, Rashid Al-Bashtawi: "Mental and Cognitive Training in Football," 1st ed., Dar Dijlah, Amman, Jordan, 2012..
11. Muhammad Al-Said 'Ali: "Comprehensive Encyclopedia of Educational Terminology," 1st ed., Dar Al-Massirah for Publishing and Distribution, Amman, Jordan, 2011.
12. Muhammad Hazim, Muhammad Abu Yusuf: "Foundations of Selecting Youth in Football," 1st ed., Dar Al-Wafa for Printing and Publishing, Alexandria, Egypt, 2005.
13. Muhammad Hassan 'Alawi, Muhammad Nasr Al-Din Radwan: "Motor Performance Tests," 3rd ed., Dar Al-Fikr Al-Arabi, Cairo, 2008.
14. Muhammad Hasan 'Alawi, Muhammad Nasr Al-Din: "Measurement and Evaluation in Physical Education, Sports, and Sports Psychology," Dar Al-Fikr Al-Arabi, Cairo, 2000.
15. Mish'al 'Adi Al-Damri: "Football Skills and Rules," 1st ed., Dar Oussama for Publishing and Distribution, Amman, Jordan, 2013.

Corresponding author: berrah hamza, E-mail: etudiant\_hamza@yahoo.com

## Combined ball training using biometric exercises has had an impact on the development of footballers' skill performance by mid-19 years

16. Mufti Ibrahim Hammad: "Modern Sports Training: Planning, Application, and Leadership," 2nd ed., Dar Al-Fikr Al-Arabi, 2001.
17. Mufti Ibrahim Hammad: "Comprehensive Training Manual (Practical Applications)," Dar Al-Kitab Al-Hadith, 1st ed., Cairo, 2010.
18. Yusuf Lazim Kmasah, Salih Bashir Abu Khayt: "Basic Principles of Football Training," 1st ed., Dar Zahran for Publishing and Distribution, Amman, Jordan, 2013.

### Theses and Dissertations:

1. Al-Dabbagh, Inmar Abdul Sattar: "The Impact of Using Different Training Systems with Weight Training on Muscle Strength and Some Basic Skills in Volleyball," Master's Thesis, unpublished, College of Physical Education, University of Mosul, 2009.
2. Al-Sufi, Anad Jargis: "A Comparative Study of the Impact of Using Plyometric and Weight Training on Vertical Jump Performance and Some Physical and Anthropometric Characteristics," Unpublished Ph.D. Dissertation, College of Physical Education, University of Mosul, 1999.
3. Al-Nu'man, Ali Zuhair Saleh: "The Effect of Using Weight Training and Plyometric Exercises on Muscle Strength and Some Skills in Young Football Players," Master's Thesis, unpublished, College of Physical Education, University of Mosul, 2005.
4. Berrah Hamza - "The Effect of Weight Training and Plyometrics on Improving and Transforming the Strength Attribute According to the Requirements of Some Football Skills for Youth Players," Doctoral Thesis, Institute of Physical Education and Sports Sciences, University of Oum El Bouaghi. (2019)
5. Diyaa Naji Ya'qoub: "The Effect of Combined Exercises on Developing Some Basic Skills in Football," Master's Thesis, unpublished, College of Physical Education, University of Baghdad, 2003.

### Journals:

1. Berrah Hamza, Ghanem Nour Al-Din: "The Effect of Some Plyometric Exercises on Developing Explosive Strength, Specific Strength with Speed, and Some Basic Football Skills: A Field Study on the Under-19 Teams of (Shawia Union / Ain Al-Baida Union)," Published Research, Majlla Al-Tahaddi, University of Oum El Bouaghi, Volume 09, Issue 02, 2017, Pages 94-120.
2. Berouak Hassan: "The Impact of Integrated Training on Developing Dribbling Skills for Young Footballers (Ages 9-12) in Oum El-Bouaghi Clubs," Published Research, Majlla Al-Mujtama'a wa Al-Riyada, University of El Oued, Volume 05, Issue 01, 2022, Pages 511-520.
3. Berouak Hassan, Maqran Isma'il: "The Impact of Integrated Training on Developing Long Passing and Dribbling Skills among Oum El-Bouaghi Football League Clubs' Juniors (Ages 9-12)," Published Research, Majlla Al-Tahaddi, University of Oum El Bouaghi, Volume 13, Issue 02, 2021, Pages 97-111.
4. Belferits Yasin: "The Impact of a Proposed Training Program Using Integrated Training Method on Improving Some Basic Skills (Passing, Shooting Accuracy, Dribbling) for Football Players Under 19," Published Research, Algerian Journal of Research and Studies, University of Jijel, Volume 02, Issue 08, 2019, Pages 155-172.
5. Da'an Abdel Mou'min, Amzian Osama: "Comparative Impact of Small-Sided Games and Integrated Training on Improving Maximum Oxygen Consumption in Under-17 Football Players," Published Research, Majlla Al-Tahaddi, University of Oum El Bouaghi, Volume 15, Issue 2, 2023, Pages 34-51.
6. Sadouk Hamza: "The Effectiveness of Integrated Training Exercises during the General and Specific Preparation Periods on Developing Skill Performance for Under-19 Football Players," Published Research, Majlla Al-Ibda' Al-Riyadi, University of M'Sila, Volume 11, Issue 01, 2020, Pages 413-432.
7. Ali Zuhair Saleh, Zuhair Qasim Al-Khashab: "The Effect of Using (Weight - Plyometric) Training on Muscle Strength and Some Skills in Young Football Players," (The Third International Scientific Conference Towards a Future Vision of Comprehensive Physical Culture), Yarmouk University, Irbid, Jordan, 2009.
8. La'idi Abd Al-Rahim et al.: "Proposing Training Units Based on the Integrated Training Method with the Ball and Their Impact on Developing Dribbling Skills for Football Players under 13 Years Old," Rawafid Journal of Studies and Research in Sports Sciences, Volume 03, Issue 01, 2023, Pages 11-22.

Corresponding author: berrah hamza , E-mail: etudiant\_hamza@yahoo.com

9. Mejaddi Fattah et al.: "Proposing Training Units for Developing Muscle Strength and Some Skill Traits in Football Players," Published Research, Majlla Al-Ibda' Al-Riyadi, University of M'Sila, Volume 10, Issue 05, 2019, Pages 404-425.
10. Ma'ani Abd Al-Karimi Jassim: "The Impact of Skill Exercises using Repetitive and Periodic Training Methods on Developing Some Basic Skills in Football," Al-Rafidain Journal of Mathematical Sciences, Iraq, Volume 20, Issue 65 (June 30, 2014), Pages 145-168.

**References:**

- 1Alexandre Dellal: Une saison de préparation physique en football, Ed De Boeck, Bruxelles, Belgique, 2013
- 2-Alexandre dellal: l'entraînement à la performance en football France. Edition de boeck supérieur 2008
- 3-Canavanpk, vescovijd: evaluation of power prediction equations, peak vertical jumping power in women, Med sei sports exerc, , 2004
- 4-Firas Zghal and others Combined Resistance and Plyometric Training Is More Effective Than Plyometric Training Alone for Improving Physical Fitness of Pubertal Soccer Players Front. Physiol., Exercise Physiology Volume 10 – 2019
- 5- Frédéric lambertin : football-préparation physique intégrée, Ed Amphora, paris , 2000
- 6Gilles Cometti, "La préparation physique en basket", Ed Chiron, 2002
- 7-Ghaith Aloui and others Effects of Combined Plyometric and Short Sprints Training on Athletic Performance of Male U19 Soccer Players Front. Psychol., Sec. Performance Science Volume 12 – 2021
- 8-Ghaith Aloui and others Combined Plyometric and Short Sprint Training in U-15 Male Soccer Players: Effects on Measures of Jump, Speed, Change of Direction, Repeated Sprint, and Balance Frontiers in Physiology February | Volume 13 | (2022)
- 9Impellizzeri.FmIetal : Physiological and performance Effects of generic versus, Specific aerobic training in soccer players. Int J Sports Med. 2006 p98.
- 10Jean-Luc Cayla , Rémy Lacrampe, Manuel pratique de l'entraînement, Amphora, France, 2007,
- 11- Marion A : Elaboration et évaluation des programmes sportifs, Ed de Boeck, paris, 2000
- 12- Makaruk, H., Starzak, M., Suchecki, B., Czaplicki, M., and Stojiljković, N.. The effects of assisted and resisted plyometric training programs on vertical jump performance in adults: a systematic review and meta-analysis. *J. Sports Sci. Med.* 19, 347–357(2020)