

The Effect of Integrated (Physical-Skill) Exercises Targeting the Development of Explosive Power of the Legs on Improving the Heading Skill in Football Players Under 19 Years Old

أثر تمارين مدمجة (بدنية، مهارية) موجبة لتنمية القوة الانفجارية للساقين على تحسين مهارة ضرب الكرة بالرأس لدى لاعبي كرة القدم اقل من 19 سنة.

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Abstract : Through this research, the two researchers experimented with an approach integrating a physical attribute and a sports skill, entitled "The Effect of Integrated (Physical-Skill) Exercises Targeting the Development of Explosive Power of the Legs on Improving the Heading Skill in Football Players Under 19 Years Old", where the study involved providing training sessions for the experimental group within the scheduled program for the "Oussoud Qaryoun" youth team during the competition phase. These sessions consisted of 01 to 03 exercises per week over a period of 02 months.

-The emergence of significant differences with statistical significance in the explosive power test results for both groups between the pre- and post-test measurements, in favor of the post-test results.

Keywords: Integrated Training, Explosive Power, Heading Skill.

الملخص : تطرق الباحثان من خلال هذا البحث الى تجريب مقارنة دمج صفة بدنية ومهارة رياضية بعنوان " أثر تمارين مدمجة (بدنية، مهارية) موجبة لتنمية القوة الانفجارية للساقين على تحسين مهارة ضرب الكرة بالرأس لدى لاعبي كرة القدم اقل من 19 سنة.

اين اعتمد على تقديم تدريبات (للمجموعة التجريبية) ضمن البرنامج المسطر لفريق أواسط نسور قريون. خلال مرحلة المنافسات وبقاوع من 01 الى 03 تمرين في الأسبوع ولمدة 02 شهر، حسب موقع التدريبات العادية المبرمجة لتنمية القوة الانفجارية، وكان الاختلاف والتغيير فقط في أسلوب التدريب المعتمد والمتمثل بالطريقة المدمجة عكس المجموعة الضابطة التي تلقت تدريباتها عادية دون أي تغيير في الأسلوب، وباستخدام المنهج التجريبي بمجموعتين متكافئتين وعلى عينة بحث عدد مفرداتها (26) لاعبا، وتوصل الباحث الى وجود فروق لدى العينة التجريبية عكس الضابطة.

الكلمات الدالة: التدريب المدمج، القوة الانفجارية، مهارة ضرب الكرة بالراس.

Introduction and problematic of the study:

Football is a team sport with immense popular interest, if not considered the premier team sport, due to the beauty and allure of its event, which combines excitement and challenge, where today's sports technological advancements, including video analysis, player movement tracking devices, and match report data that highlight a team's strengths and weaknesses, have enabled those in charge of football teams to identify the genuine causes of deficiencies in specific physical attributes or skills, achieving an almost comprehensive diagnosis of obstacles, whether physical or techno-tactical. Consequently, match outcomes and the achievement of titles and tournaments often hinge on minute details; any random movement or missed opportunity can grant the opponent an advantage, if not the title itself. A football player is thus compelled to master all the game's skills proficiently to fulfill the desired technical and tactical design within the game plan, as upon contemplating the execution of game skills during matches, one would deduce that each motor skill has its own specific physical requirements.

Furthermore, observers of youth matches at the national level, particularly specialists, note a significant deficiency in the players' ability to head the ball effectively, both during open play and in front of the goal, resulting in the squandering of clear scoring opportunities; this issue has been frequently analyzed by experts and researchers in the field of football development, who have at times attributed the failure to a physical weakness in the players' lower limbs, and at other times to a sheer lack of accuracy. Moreover, modern football

features a diversity of player profiles with distinct individual and collective characteristics, paralleled by a diversity in the profiles of physical trainers, making it imperative to consider players based on their multitude of specific attributes (Khodja Basim, 2022, p. 142).

Among the modern training methodologies that have gained prominence in various sports, especially team sports, is integrated and holistic training; this approach is fundamentally based on developing physical attributes through ball-oriented exercises that are intrinsically linked to the technical aspect within tactical scenarios mimicking real-match conditions (Malaouhia Sami Fawzi, Refas Badis, 2023, p. 97).

Examining the core principles and advantages of integrated training, which combines physical and technical drills tailored to the demands of actual gameplay and places the athlete in problem-solving situations or scenarios requiring in-the-moment solutions during practice, reveals its capacity to foster a genuine, cohesive physical and technical performance capability in the athlete, which enables the fluid and ideal execution of technical and tactical duties, which is a direct reflection of the targeted training stimuli received for various in-game situations, thereby culminating in a performance marked by creativity and motor fluency; consequently, coaches must possess not only interpersonal and personal skills but also practical competencies to design preparation that closely simulates actual match conditions, aiming for athletic superiority and the attainment of set objectives .

A player can successfully deceive opponents, change direction and speed adeptly, bypass defenders optimally, and execute a skill with the required precision, if his musculature is in an optimal state, primed for the type of performance demanded in competitive matches under opponent pressure (Sado Mohamed Amine, Bouhadj Mezian, 2022, p. 188); however, developing muscular strength for football players is a complex undertaking due to the significant interplay between its various components; this is because the human muscular system operates on the principle of synergy between different muscles and motor units, which complicates the process of training and developing one physical attribute in isolation without influencing or being influenced by others .

Explosive power, defined as the muscle's ability to overcome maximal resistance with high-speed execution, exemplifies this interplay, revealing the convergence of strength elements—namely maximal force output—applied within an optimal time frame for performance and within a specific skill-based context; indeed, an analysis of the heading skill and its physical and technical prerequisites clearly demonstrates the substantial overlap between the elements of strength and time—that is, execution speed—coupled with the player's capacity to perform the skill accurately towards the intended target (Talha Houssam Eddine et al., 2003, p. 67).

Based on the foundation established in the introduction, the researcher was motivated to investigate this topic through a field study, formulated around the following central question:

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"Does developing the explosive power of the legs through integrated (physical-skill) exercises affect the improvement of the heading skill in football players under 19 years old?"

Research Hypothesis

The investigation begins by formulating the following hypothesis, which serves as a preliminary answer to be confirmed or refuted by the study:

"Developing the explosive power of the legs through integrated (physical-skill) exercises affects the improvement of the heading skill in football players under 19 years old."

Research Objectives

The study aims to achieve the following objectives:

1. To measure the impact of integrated structural and skill-focused training for explosive power on the performance outcome of the heading skill.
2. To determine the extent of improvement in the heading skill following exposure to the proposed experimental intervention.
3. To conduct a comparison between pre-test and post-test measurements to identify statistically significant differences between the two groups.
4. To contribute to the enhancement of training methodologies for junior players, particularly by promoting comprehensive and integrated training approaches that align with the developments in modern football.

Significance of the Research

This research seeks to provide a scientific and cognitive addition to the field of youth training by employing modern methods, such as integrated training,

tailored to the demands of real competition; furthermore, it aims to present a practical, applicable training model utilizing the integrated approach for developing a physical attribute alongside a sports skill. Ultimately, it reinforces the principle of moving away from fragmented, traditional sports training towards a modern methodology based on integration within optimal and realistic situational contexts.

Previous and Similar Studies

Study by Touati Sami and Muhmal Hicham (2022), titled "The Effect of Integrated Exercises on Developing Some Fundamental Skills in Football Players Under 17 Years Old": The objective of this study was to uncover the effect of proposed integrated exercises on developing the skills under investigation, and to detect the statistical differences between pre-test and post-test measurements for dribbling, feinting, and shooting skills in football players under 17 years old. The researchers employed the experimental method with a two-group design (one experimental and one control group) on a research sample of 24 players, as the experimental factor, consisting of integrated physical and skill exercises, was applied to the experimental group but not the control group .

By using the SPSS statistical package to analyze the test results and answer the study's questions, a key finding revealed statistically significant differences between the pre-test and post-test measurements for both samples in the post-test results, attributable to the experimental factor, and in favor of the experimental sample; finally, the researchers recommended the necessity of adopting an integrated approach in training and instructing sports skills in

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football, due to the advantages it offers by simulating real-game situations and helping players internalize the technical execution of the skill as a whole, as well as they also suggested conducting similar studies on different research samples to generalize the findings across football programs.

Study by Barouak Hassan et al. (2020), titled "The Effect of Integrated Training on Developing Skills (Long Passing, Dribbling, and Shooting)": This research aimed to identify the effect of integrated training on developing the skills under study—namely long passing in football, dribbling, and shooting on goal—among youth football players aged 15 to 17 years, representing a research sample of 32 players from the youth teams of Dhlela and Union Ain Beida in the Wilaya of Oum El Bouaghi. The researcher utilized a training approach by testing the research sample based on two groups: one experimental group undergoing integrated training for the aforementioned skills, and a control group, whose results were used to compare the post-test results of the experimental group to judge the rate of development or improvement in the studied skills. The study relied on tests, including kicking the ball for maximum distance and shooting from different points at the goal, where the research results concluded that there were substantial differences between the initial assessment (pre-tests) and the final assessment for all skills under investigation, attributed to the independent study variable represented by the integrated training, which caused the change and difference between the two groups.

Study by Aider Hocine et al. (2021), titled "The Effect of a Training Program for Developing Explosive Power and Speed-Strength on Some Skills in

Football among Middle School Students Aged 12-14 Years": This study aimed to determine the effect of a training program designed to develop explosive power and speed-strength on some football skills in middle school students, as the researchers followed the experimental method by applying a proposed training program that incorporated the principles and foundations of integrated training for the attributes of explosive power and speed-strength, and observing its outcomes on fundamental football skills represented by long passing, dribbling, and shooting on goal. This work targeted middle school students aged 12-14, specifically those participating in school sports for the year 2018, totaling 350 students, with a research sample of 50 students representing 14% of the total population. The researchers concluded that integrated training is a modern training method that addresses the shortcomings of traditional training by opening the door for player and student creativity and directly linking the physical attribute to the motor skill in a manner similar to real competition; furthermore, the proposed training program had clear positive effects on improving the skills under study, confirming the need for it and its adoption by various bodies responsible for youth education and training.

Commentary on Previous Studies:

Considering previous and similar studies as beacons that illuminate the path for a researcher to discover the angles of their own investigation, after the researcher's review and analysis of the selected studies, it became evident that all the studies fell within the research topic of integrated training; whether concerning comprehensive integrated physical preparation for physical

attributes or the integration of certain physical attributes with the fundamental skills of the specialized sports activity. These studies relied on the experimental method in addressing the topic, and regarding the research samples, nearly all studies employed purposive samples. As for the results of the research, they were all positive, achieving or answering their respective research questions and concluding that there were genuine relationships between the independent and dependent variables of the studies; this indicates substantial common ground between them and our current study.

Research Terms

Integrated Physical Training:

Conceptual Definition: A fundamental objective for coaches at elite levels involves designing preparation that closely replicates competitive environments; this philosophy necessitates training situations that simulate actual match conditions, ultimately fostering high-level athletic performance; therefore, the optimal training methodology facilitates the replication of in-game demands during each session, based on the principle of integrating physical, technical, and tactical goals (Gilles Cometti, 2004). 2.1.2 Procedural Definition: For this study, comprehensive and integrated training is defined as a modern coaching methodology that differs from traditional approaches in its design and objective-setting; whereas traditional training often compartmentalizes elements of play, this method is characterized by implementing practice situations that directly mirror the specific scenarios players encounter during matches.

Explosive Power:

Conceptual Definition: Abbas defined it as "the ability of an athlete to overcome a resistance at near-maximum levels in the shortest possible time" (Imad Eddine Abbas et al., 2007, p. 270).

Procedural Definition: In this research, explosive power refers to the athlete's capacity to generate a high level of force in the lower limbs within a minimal time frame, specifically measured through performance in standardized vertical and/or horizontal jump tests.

Heading Skill:

Conceptual Definition: The skill of heading the ball is a crucial component of football, prevalent throughout all phases of play; it serves as a primary method for scoring goals, particularly in situations where using the feet is impractical, and is equally vital for defenders when clearing threats from the goal area and intercepting opposition passes (Al-Sayed Zahran, 2008, p. 18).

Procedural Definition: Within the context of this investigation, heading skill is defined as the player's competency in accurately and powerfully directing the ball with the head towards a designated target, which is quantitatively assessed by the precision and distance of headers executed from both stationary and jumping positions during specific standardized tests.

Research Methodological Procedures

Research Methodology

The researcher employed the experimental method, selected due to the requirements of the research problem, which necessitated experimentation; addressing the observed problem from this specific angle and answering its

question required fieldwork and testing. This type of research is based on attempting to isolate all extraneous variables, both directly and indirectly related to the research variables, while controlling and directing the experimental factor towards the dependent variable in alignment with the research objectives to address the presented problem and find solutions, as experimental research is an approach that enables determining the existence of a relationship between research variables and understanding the degree of that relationship (Al-Assaf, Saleh bin Hamad, 2000, p. 198). This relationship is quantified using the correlation coefficient, which allows us to estimate the relationship between two variables; if the correlation between them is high, the coefficient approaches +1 or -1, whereas if they are unrelated, the obtained coefficient approaches zero (0); the stronger the correlation between the variables, the greater the accuracy of predictions based on this relationship.

Research Population and Sample

In the realm of research and inquiry, the population refers to all units relevant to the experiment, meaning all individuals falling within the scope of the phenomenon under study, as a characteristic of scientific research is relying on a sample that the research team can feasibly manage, which truthfully represents the larger population without discrimination among its individuals and is of sufficient size for representation (Ahmed AttAllah et al., 2009, p. 68). In our study, the population is represented by players participating in the Oum El Bouaghi (East) state-level football championship for players under 19 years old, comprising 08 teams. The research relied on the Oussoud Qaryoun team as a

representative sample selected purposively, where the total sample size was 26 players, and using a two-group design (experimental and control), the sample was divided into 13 individuals for the experimental group and 13 for the control group.

Research Domains

Spatial Domain: Al-Shahid H'bair Younes Stadium, Henchir Toumgheni – Oum El Bouaghi.

Temporal Domain: The study protocols commenced at the beginning of September 2024. The field experiment lasted for 02 months.

Human Domain: The current study included individuals participating in the Eastern State Football Championship as the research population, totaling 146 individuals, with the Nusour Qaryoun Henchir Toumgheni team serving as the research sample, consisting of 26 players.

Procedural Control of Research Variables

Independent Variable: Integrated (physical-skill) exercises targeting the development of explosive power in the legs.

Dependent Variable: Heading skill performance in football players.

Research Tests and Measurements

Sargent Jump Test

a. Purpose: To measure the vertical explosive power of the lower limbs.

b. Equipment: A wooden board measuring 1.5m in height and 0.5m in width, marked with horizontal lines spaced 2cm apart.

c. Procedure:

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*The athlete is given a piece of chalk and stands facing the board.

*They reach upwards as high as possible with one hand to mark the board with the chalk, establishing a standing reach height.

*From a static position, the athlete performs a countermovement jump and marks the board at the peak of their jump.

*Each athlete is allowed three attempts, with the best attempt recorded for analysis (Broussas, Aurélien et al., 2012, P38).

d. Scoring: The score is the difference in centimeters between the standing reach height and the jump height.

Heading for Maximum Distance Test

a. Purpose: To assess the player's ability to head a football for maximum distance and accuracy.

b. Procedure:

*Transverse lines are marked parallel to the starting line.

*The first line is 5 meters from the starting line, with subsequent lines spaced 1 to 1.5 meters apart.

*A ball is thrown high towards the tested player, who must head it towards the designated scoring zone.

*Each player is granted three valid attempts.

c. Scoring: The player's score is based on the farthest distance achieved in a valid attempt, according to the following criteria:

*If the ball lands between the start line and the first line (5m): 1 point.

07 - 06 *meters: 5 points.

08 - 07 *meters: 6 points.

09 - 08 *meters: 7 points.

10 - 09 *meters: 8 points.

11 - 10 *meters: 9 points.

*Any distance exceeding 12 m: 10 points (Yousif Lazim Kammach et al., p. 289).

Psychometric Properties of the Instrument

Test Reliability

As noted by Mohamed Sobhi Hassanein (1992, p. 25), a one-week interval between test applications in physical education is considered an appropriate procedure for establishing reliability coefficients. Using Pearson's simple correlation coefficient and referencing the critical value for the simple correlation coefficient at a significance level of 0.05, the reliability results for the tests under study were derived as follows:

- ✓ The Sargent Jump Test reliability coefficient equals 0.75.
- ✓ The Heading the Ball Test reliability coefficient equals 0.73.

These results indicate that the tests under investigation demonstrated acceptable reliability and stability throughout the application and re-application phases.

Test Validity

Validity can be considered one of the most crucial criteria for a good test; it signifies the test's ability to accurately measure the specific trait or phenomenon for which it was designed.

Statistical Treatments

To address the study's research questions, the following statistical procedures were processed using spreadsheet software (Excel):

- ✓ Calculation of Arithmetic Means.
- ✓ Calculation of Standard Deviations.
- ✓ Application of Student's t-test.
- ✓ Computation of the Simple Correlation Coefficient.

Presentation and Interpretation of Results:

Presentation and Interpretation of Results for the Experimental and Control Samples:

Table (01) shows the results obtained from the pre-tests for the two research samples:

Preliminary y- Preliminary y The two samples	Statistical treatment									
	Pretest of the experimental sample		Pretest of the control sample		Sample	of freedom	At the significance level	Calculated t	Tabular t	Statistical significance
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation						
Sargeant's test	32.15	6.12	31.08	5.94	13	24	0.05	0.45	2.06	Not significa nt
Heading the ball test	3.85	0.8	3.46	0.66	13	24	0.05	1.33	2.06	Not significa nt

The results in Table (01) show the pre-test outcomes for the experimental and control groups, as in the Sargent Jump Test for explosive power, the experimental group achieved a mean score of 32.15 with a standard deviation of 6.12, while the control group recorded a mean of 31.08 with a

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standard deviation of 5.94. The calculated t-value was 0.45, compared to a critical t-value of 2.06 at 24 degrees of freedom; these results indicate no statistically significant differences between the two groups, confirming their initial equivalence in this measure.

Regarding the heading skill test, the experimental group attained a mean score of 3.85 with a standard deviation of 0.8, whereas the control group achieved a mean of 3.46 with a standard deviation of 0.66. The calculated t-value here was 1.33, against the same critical t-value of 2.06 at 24 degrees of freedom, where these findings also indicate no statistically significant differences between the groups, further verifying their initial equivalence in heading skill performance before the intervention.

Table No. (02) shows the results obtained from the pre- and post-measurements of the experimental research sample:

Experimental Sample	Statistical treatment									
	Pretest of the experimental sample		Pretest of the control sample		Sample	Degrees of freedom	At the significance level	Calculated t	Tabular t	Statistical significance
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation						
Sargeant's test	32.15	6.12	43.77	4.94	13	12	0.05	6.52	2.17	significant
Heading the ball test	3.85	0.8	5.62	0.63	13	12	0.05	6.16	2.17	significant

The results presented in Table (2) for the experimental group in both the explosive power and heading skill tests reveal significant findings. In the explosive power test (Sargeant Jump), the group recorded a pre-test mean of 32.15 with a standard deviation of 6.12, whereas the post-test mean was 43.77 with a standard deviation of 4.94. The calculated t-value was 6.52, compared to the critical t-value of 2.17 at 12 degrees of freedom ($p < 0.05$); these results indicate the presence of statistically significant differences between the pre-test and post-test measurements, in favor of the post-test.

Similarly, in the heading skill test, the group achieved a pre-test mean of 3.85 with a standard deviation of 0.8, while the post-test mean was 5.62 with a

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standard deviation of 0.63. The calculated t-value here was 6.16, against the same critical t-value of 2.17 at 12 degrees of freedom. These findings also confirm the presence of statistically significant differences between the pre-test and post-test measurements, in favor of the post-test results.

Table No. (03) shows the results obtained from the pre- and post-measurements of the control research sample:

Control Sample	Statistical treatment									
	Pretest of the experimental sample		Pretest of the control sample		Sample	Degrees of freedom	At the significance level	Calculated t	Tabular t	Statistical significance
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation						
Sargeant's test	31.08	5.94	37.62	6.93	13	12	0.05	2.55	2.17	significant
Heading the ball test	3.46	0.66	3.38	0.51	13	12	0.05	0.32	2.17	significant

The results presented in Table (3) for the control group in both the explosive power and heading skill tests indicate the following outcomes. For the explosive power test, the group recorded a pre-test mean of 31.08 with a standard deviation of 5.94, compared to a post-test mean of 37.62 with a standard deviation of 6.93. The calculated t-value was 2.55, which exceeds the

critical t-value of 2.17 at 12 degrees of freedom ($p < 0.05$). This indicates the presence of a statistically significant difference between the pre-test and post-test measurements, in favor of the post-test results.

However, in the heading skill test, the group achieved a pre-test mean of 3.46 with a standard deviation of 0.66, while the post-test mean was 3.38 with a standard deviation of 0.51. The calculated t-value here was 0.32, which is below the critical t-value of 2.17 at 12 degrees of freedom. Consequently, these results demonstrate that there is no statistically significant difference between the pre-test and post-test measurements for the heading skill within the control group.

Discussion of the Research Hypothesis:

The hypothesis states: "Developing the explosive power of the legs through integrated (physical-skill) exercises affects the improvement of the heading skill in football players under 19 years old."

The results of the current research indicate that the adopted hypothesis was partially confirmed, based on the outcomes of the statistical analyses. These analyses revealed the existence of statistically significant differences in the control group between the pre-test and post-test measurements for the explosive power of the lower limbs, as measured by the Sargent Jump test, which is attributed to the regular and scheduled training sessions for this group, albeit conducted using the traditional training method.

In contrast, the control group did not achieve any statistically significant improvement in the heading skill test, despite an improvement in the explosive power variable, which is the primary physical attribute directly linked to a

player's ability to jump and head the ball. The researcher attributes these results to an almost complete absence, among the control group members, of training that addresses the specific requirements for executing a headed ball in flight, due to their reliance on outdated training methods based on segregating physical preparation for individual physical attributes and training skills separately from physical performance, utilizing non-complex, non-integrated training forms, but this approach lacks the interconnectedness and communication between the nervous and muscular systems, unlike the conditions and contexts of real-game situations.

Regarding the results of the experimental group, which statistically confirmed the effect of the experimental factor used in this current research—namely, integrating the physical work for explosive power with the heading skill—a noticeable improvement was observed, as the researcher attributes this development to the comprehensive and integrated training approach, which holistically prepared the players from both physical and skill perspectives, where integrating the ball into physical work significantly contributed to the players' comprehension of game situations and the formation of technical and tactical mental models from training scenarios that simulated competition. This approach enhanced the role of the nervous system in rapidly understanding and responding according to the player's positioning and the ball's trajectory, as the training objectives were defined through diverse exercises using semi-competitive and competitive means, ensuring that the training factors (technical, physical) assisted in preparing and developing the overall preparation

components based on a fundamental organization of the role and position of physical capacities relative to technical and tactical performance. By integrating physical preparation and the development of players' explosive power through training units with intensities approximating real competition and with combined physical-skill objectives, the level of heading skill improved, and this finding is supported by numerous established theories and scientific principles (Alexandre Dellal, 2008, p. 158).

The results of our research align with the findings of many other studies, such as that of Barouak Hassan et al. (2020) and Aider Hocine et al. (2021); this convergence stems from the fact that progressing in football and guiding players to higher levels is fundamentally based on providing a solid foundational structure from the age of early awareness through to youth, adhering to the rules and foundations of modern sports training, which necessitates coaches adopting a comprehensive and integrated method, as it represents an ideal and model form of preparation for real competition and is a newly adopted approach, particularly in team sports.

Conclusion

The foundation for attaining high-level athletic excellence and achieving championships and record performances is built upon foundational development during childhood and youth, to cultivate players capable of keeping pace with the evolution of football, with its modern strategies and intricacies, which demand from the player an integration of all factors of superiority—physical, technical, tactical, and psycho-social—as a unified

whole, which necessitates employing all contributing sciences to advance the sports training system towards progress and sophistication. In this context, the integrated sports training method represents a new direction and approach for development and coaching; it acclimatises the player to the atmosphere of competition and facilitates the acquisition of motor gestures and skills aligned with the required physical attributes, as well as it encompasses elements and components that inherently address the real and practical needs of the individual player and the team, targeting higher performance levels and the achievement of objectives, whether short-term, seasonal, or long-term.

Therefore, based on the findings of this research, it can be concluded that comprehensive and integrated training constitutes an ideal and model training approach and an effective methodology for team sports, as it reaffirms that fragmenting the elements of athletic excellence into separate parts and units deprives the player of the required technical and tactical execution in competitions, and that any physical work should ultimately be in service of a sports skill.

Recommendations

In light of the study's findings and conclusions, the following recommendations are proposed:

-For Coaching Practice: It is recommended that football academies and youth coaches systematically incorporate integrated (physical-skill) training modules into their periodic plans, especially during the competition phase, to enhance skill acquisition and transfer to match performance.

developing and disseminating standardised training guidelines and curricula for youth development that emphasise the principles of integrated training, moving beyond traditional segmented methods.

-Conduct longitudinal studies to examine the long-term effects of integrated training on athletic development and injury prevention, and to explore its efficacy across different age groups and competitive levels within football.

-Coach certification programs should place greater emphasis on modern training methodologies, including integrated training, equipping coaches with the practical knowledge and tools to design and implement such sessions effectively.

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