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Studying the effect oftraining with Small-Sided Games on the development of starting speed, Transitional speed, and speed-endurance of footballers less than 15 years old

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Abstract :

The present research paper aims to investigate the effectiveness of a proposed training program with small-sided games in the development of starting speed, transitional speed, and speed endurance). Furthermore, the study sample consists of 40 footballers under 15.The latter were randomly chosen, represented by 20 footballers from the 'Chaouia Union' (as an experimental group) and 20 players from the 'Ain Mlila Association' (as a control group).The experimental method was used for its suitability to the nature of the study. We conducted physical tests, and trained for a period of (8) weeks, with three training sessions per week, and then conducted post-tests,after which we performed the necessary statistical treatment and analysed the results of the study and found that the proposed training program had a positive impact on the development of (starting speed, transitional speed, and endurance of speed) for football players less than 15 years old and the superiority of the experimental group players in developing speed.

Keywords: small-sidedgames, starting speed, transitional speed, speed endurance, category under 15 years old.

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1. Introduction:

In comparison to other African teams, Algerian football has considerably declined over the past ten years, and the country's teams have fallen into a difficult-to-exit spiral. In recent years, the development of these components, which serve as the cornerstones and guiding principles of contemporary football, has lagged behind the absence of local players from the national team and their perceived inadequacy in every physical, technical, tactical, and psychological aspect.

Although many studies and research in the field of football training in general and training of small groups, in particular, have focused on the process of Programming or scientific principles of sports training, the game of football has evolved in recent years and the character of playing has changed due to the variety of modern ways of playing, where the physical level has increased and the level of technical, physical, tactical, and psychological performance has increased. However, these studies did not address qualitative exercises in terms of performance and muscle work and their relationship to the requirements of playing football. Also, in the recent period, interest in the form and quality of motor activity of players in the field of football during matches has begun, which shows the importance of the need for a special type of training in line with the nature of physical, technical, tactical and psychological performance and changing playing situations.

The development of physical, technical, tactical, psychological, and mental skills as well as the creation of similar situations, such as competition, are necessary for achieving athletic success; “a football player who has knowledge and experience in the arts of the game and uses his tactical field intelligence to play and fight for Achieving the goal with great effectiveness can excel with his team and get good results in matches, and this superiority and success requires the presence of the basic factors for developing attack and defence tactics, which are physical capabilities and capabilities, high level of skill performance, stability and development of psychological and moral qualities, and players’ ability to think tactically and correct behaviour in different playing situations**.**(Muwaffaq, 2009, p. 95)

2. Statement of the problem

The most recent training and educational techniques and programs have been made available to us in the modern-day by experts and specialists. These methods and programs are based on a number of contemporary sciences that

interact with the biological, biochemical, and other fields. The goal of these contemporary training regimens is to perform at the greatest level and produce football. then hold onto it for as long as you can. Everyone is aware that training programs, especially for smaller groups of players, play a significant and delicate role in player development. As it is the means by which players can acquire physical and technical capabilities and various playing plans that contribute to raising their level to the maximum degree, and this is only done through preparing codified training plans and programmes, and this is confirmed by Weineck, which he says: Sports practice clearly showed that A high level cannot be achieved unless it builds a solid base during childhood and adolescence, and this is what necessitates long-term planning in the field of training. In this context, attention must be drawn to the many problems that Algerian football suffers from, especially the youth groups, which are very important age groups for the optimal construction of the simultaneous sports specialization for the adolescence stage for the 15-year-old stage, where it suffers from a lack of hourly volume, weekly and annual training, and the use of traditional methods in training.

Football has changed in every aspect: technical, tactical, psychological, and physical—and these changes have improved athletic performance. However, this shift in the sorts of intensity used in competition necessitates a change in training techniques and equipment. Scientific studies have also shown that the basis of modern training includes integrated training with work-oriented small-sided games, a mixture of physical, technical, tactical and psychological qualities**.**(Della, 2013, p. xll)

Small-sided games are considered among the modern uses in the field of football training because of their similar conditions in football competitions performance-wise. Here is the opinion of some training columns in football about small games: “Small games are a very important part of training and they are loved before by the players and are their favourite part of the training session because it is more competitive” (Jurgen Klopp). “Training in tight spaces is very useful because you do not give the players time to think... it helps to make the right decision in the right moments” (Pep Guardiola). “should be similar to the situations of the match” (Dr Dehbazi Muhammad),and the most imposing this training method is its dependence on the ball, which gives the training load a qualitative character extracted from the peculiarities of real competition and the development and keeping pace with the speed of play. Speed is one of the components of physical preparation and one of the important pillars to reaching

high sports levels. Speed has always been the distinguishing mark among distinguished players.(Barakat & malouq , 2022, p. 208)

Speed is one of the main factors of achievement in the field of physical fitness, where its importance appears on the football field through its decisive influence, and in the process of building a quick attack during the course of play or in the dual conflicts, or the importance of surprise, stopping, obstructing, or at least weakening the opponent team's counter-attack.(FIFA, 2012), speed is an essential element in modern football, where, during the competition, players perform 700 meters of speed (100 to 140) for variable distances between a few meters and 50 meters, and with rest periods ranging from 30 to 40 seconds. Various Studies and analyzes show that the player has a maximum speed of between 40 and 50 metres. (FIFA, 2012)

Based on these data that represent the high leagues and those physical, technical and tactical difficulties that indicate the phenomena contrary to modern football, the lack of quotas, the size of the training courier and the methods used in training for the category of less than 15 years, which is witnessed in our reality in Algeria, and as we are specialists, and a desire from us In raising the physical performance, especially the quality of speed in Algerian football and a profit of time, which made us combine all of this in

2.1 The central question: Is training with small-sided games (the proposed training program) effective in developing the speed of football players less than 15 years old?

2.2 Sub-questions:

-Is training with small-sided games (the proposed training program) effective in developing the starting speed of football players less than 15 years old?

-Is training with small-sided games (the proposed training program) effective in developing the transitional speed of football players less than 15 years old?

-Is training with small-sided games (the proposed training program) effective in developing the speed-endurance of football players less than 15 years old?

-Are there statistically significant differences between the results of the post-test of the control and experimental sample in terms of speed in favour of the experimental sample?

3. Research hypotheses:

3.1 The general hypothesis:

training with small-sided games (the proposed training program) is effective in developing the speed of football players less than 15 years old.

3.2 Sub Hypotheses:

-Training with small-sided games (the proposed training program) is effective in developing the starting speed of football players less than 15 years old.

-small-sided games training (the proposed training program) is effective in developing the transitional speed of football players less than 15 years old.

-small-sided games training (the proposed training program) is effective in developing the speed-endurance of football players less than 15 years old.

-There are statistically significant differences between the results of the post-test of the control and experimental sample in terms of speed in favour of the experimental sample.

4. Research objectives:

- Highlighting the position of speed (starting speed, transitional speed, endurance speed) in determining the sporting achievement of football players less than 15 years old.
- Determining the role and impact of the proposed training program with small-sided games in developing speeds (starting speed, transitional speed, speed endurance) for football players less than 15 years old.
- Determining the extent of readiness of football players under 15 years of age in accepting training with small-sided games and evaluating their response to the proposed program.
- Identify the most effective ways and methods to raise the level of speed (starting speed, transitional speed, endurance speed) in football.
- Identifying the statistical differences between the post-test of the control and experimental sample.

5. Defining concepts and terms

5.1 small-sided games

José Mourinho talking about small-sided games states that "I advocate the holistic news of training, without separating the physical, technical, tactical and psychological components". "The traditional concepts that we can look at in books are general training methods and far from what I think is good. There is no insight into strength, resistance and speed without contextualizing football and primarily according to the style of play.(Dellal, 2017, p. pvll)

Procedurally: We mean the confrontation and competition between two or more teams using the ball, with a specific number of players in suitable spaces and with exact rules of play to achieve the goal of training. (Mohamed abdel wareth & wadah, 2022, p. 612)

5.2 Starting speed:

The idiomatic definition: is the ability to move forward as quickly as possible, and Allawi says, “It is the ability to move and move from one place to another as quickly as possible”.(Abu Alaa Ahmed , 1997, p. 187)

5.3 Transitional speed:

Idiomatically: The term “transition speed” often refers to “ the sprint”. As in running fast to catch the ball before the opponent or to participate in defence and attack, switch positions and escapes from control or in other words to achieve the basic principles of plans such as the ability to move and exchange positions, support, or create spaces for penetration.(albissat , 2001)

5.4 Speed Endurance:

The ability to continue performing symmetrical or asymmetric movements and to repeat them efficiently and effectively for long periods at high speeds without decreasing the level of performance efficiency.(Mufti , 2009)

5.5 The category of less than 15 years:

The researchers define it as a link between the primary education stage and the secondary education stage. This stage lasts according to the structure of the education system in Algeria for four years, during which the student enters the adolescence stage and undergoes many changes both sexual and physical in nature.(Bakhtawi , elhadj, tahar, & ataallah, 2022, p. 612)

6.Previous and similarstudies :

6.1. “M. Tchokonte” study in 2011 : The aim of this study was to determine the effects of the method of the small-sided game on the physical, technical, tactical and psychological aspects of football players.

6.2. Abdul Haq Abbad’s study in 2019 : The study aimed to show the importance of the blended training method, by comparing it with analytical or separate training.

6.3. Aqli Hussein’s study in 2018 : The study aimed to suggest a method of small-sided games to develop some of the physical and skill traits of football players less than 23 years old.

7.The practical aspect and the methodological procedures of the study

7.1 Survey study:

The researcher conducted the exploratory study on a sample of the same age group consisting of 8 players from Al-Talaghmeh Club.

7.2Study Variables:

7.2.1 The independent variable*:* Is represented in training with "small-sided games" in the proposed training program.

7.2.2 Dependent variable: It is represented in the types of "Speed ".

7.3 Research sample:

In our experience, the sample will consist of 40 players. The sample represents18 .81% of the original population and is sufficient to study.

7.4 Research areas:

The human field: theChaouia Union, Ain Mlila Association, Talaghmehclub.Time-domain: 2022, Spatial domain: Municipal stadiums for teams.

7.5 Research Methods:

Physical tests: 10m Speed.(Cometti, 1997), 20m transitional Speed.(sinis , 1974, pp. 25-27)**,** 4×10m Speed endurance.(Cloy, 1954, pp. 135-144)

7.6 Scientific conditions for the instrument :

7.6.1 Test reliability:

Muqaddam Abdel Hafeez defines that it will give the same results if this test is repeated on the same individuals and under the same conditions. The researcher applied the tests to a sample of 08 players from the Talaghmeh club, and after a week of applying the tests, they were re-applied to the same sample.

Calculate the normal distribution for the Shapiro-Wilk test:

The test probability was as follows: 0.1300,0.3380, 0.5360, 0.3640, 0.8850, 0.3180 for all tests of tribal and dimensional Speed, which is greater than the 5% error rate and therefore the tests are distributed normally, and after obtaining the results, the researcher calculated the correlation coefficient. The simple known Pearson correlation to ensure that the set of tests has a high degree of stability as shown in the table:

Tests	mean	Std. Deviation	mean of retest	Std. Deviation	stability coefficient
10 m	2.356	0.17270	2.3688	0.18589	0.922
20 m	3.941	0.36814	3.9300	0.42975	0.944
4 x 10m	11.305	0.56548	11.267	0.236	0.970

Source:spss, 2022

7.6.2. Validity of the test:

It is measured by calculating the square root of the test reliability coefficient(Moqaddam , 1993, p. 152). It was found that the tests have a high degree of self-veracity as shown in the table.

Tests	sample size	Test stability coefficient	Test validity coefficient
10 meters speed.	8	0.922	0,960
20 meters speed.	8	0.944	0,971
4 x 10 meters speed	8	0.970	0,984

Source:spss, 2022

A table showing the reliability and validity coefficients of the physical tests approved in the research. Thus, the exploratory study achieved its objectives

7.6.3. The objectivity of the test:

It is expressed by the correlation coefficient. Accordingly, the tests taken enjoy high objectivity.

7.7 Content of the approved training program:

The design of 24 training units in the manner of training withsmall sided games and distributed over 8 weeks with 3 training sessions as shown in the plan and the weekly program

We relied on rationing the external load, working time, rest and intensity, on the tables of experts in the list of references:

(Chiha , 2022, p. 57), (Aguiar, 2012), (Longer , 2015, p. 9)

The duration of the exercise varies according to the number of players, the area, and according to the experts and their legalization

The working volume is 90 minutes, the heating stage is 20 minutes, the main stage is 60 minutes, and the final stage is cooling down 10 minutes

Rely on the heart rate monitor polar device to control the severity of pregnancy during pregnancy

The average load is from 50 to 75% of the maximum estimation of the individual, which is equivalent to 165 p/min

The less than maximum load reaches 90% of the individual's maximum capacity, i.e. from 180 to 190 p/min.

The maximum load is 100% where the pulse reaches more than 190 p/min

The plan of the training stage: two stages, each stage in a month.

program of the week:

Monday: Technical majority, ball coordination, art-themed small-sided games, technical-themed small-sided games, art-themed game, back to normal / stretches, Tuesday: rest.

Wednesday: the majority of the game principles of play, warm-up in the form of a game, small-sided games pose, tactic-technic, in the form of a small-sided games + free play, muscle strengthening and returning to the natural state.

Thursday: Mixed session, speed/energy, preparatory small-sided games, technical/principles of playing, in the form of small-sided games/technical/play principles + free play, back to normal, Friday: rest, Saturday: matches, Sunday: rest.

We relied on the RPE method, heart rate monitor polar to fill the load in every training session, week and month.

1. Presentation of the analysis of the results of the study:

8.1 Presentation and analysis of the results of the tribal tests for the control and experimental sample:

Statistical study		Levin's test		t-test for equality of means					Statistical significance
Tests		Fisher	Sig	T test	Df	Sig	Mean Difference	Std. Deviation. D	
Length	e.v.a	1.10	0.30	0.11	38	0.908	0.003	0.299	There is homogeneity
Weight	e.v.a	0.53	0.47	0.65	38	0.519	1.765	2.711	There is homogeneity
Age	e.v.a	1.87	0.17	0.94	38	0.350	0.150	0.158	There is homogeneity

Source:spss, 2022

Through the table it becomes clear to us that: The two groups are homogeneous in (height, weight and age). The probability value of t was

respectively (0.908, 0.519, 0.350), which is greater than the significance level of 0.05 at the degree of freedom of 38, and this indicates the homogeneity of a sample.

Statistical study / Tests		Levin's test		t-test for equality of means					Statisticalsignificance
		F	Sig	T test	Df	Sig	Mean . D	Std. Deviation. D	
10 m	e. v. a	0.94	0.338	0.943	38	0.352	0.050	0.5303	SS
20m	e. v. a	0.60	0.442	0.315	38	0.755	0.265	0.0842	SS
4×10 m	e. v. a	0.57	0.455	0.690	38	0.494	0.106	0.1543	SS

Source:spss, 2022

From the table, it becomes clear to us that: The two groups are homogeneous in the speed tests (10m speed, 20m transitional speed, 4x10m speed tolerance). The probability t is (0.352, 0.755, 0.494), which is greater than the 5% error rate, and the degree of error is 5%. Freedom 38, there are no statistical differences, and this indicates the homogeneity and equivalence of the research sample in these tests before conducting the program.

8.2 Presentation and analysis of the results of the pre and post-tests for the control sample:

stats / Tests	Pre-test of the control group		Post-test of the control group	
	mean	Std .Deviation	Mean	Std .Deviation
10 m	2.438	0.183	2.343	0.179
20 m	3.950	0.285	3.865	0.272
4×10 m	10.97	0.518	10.81	0.117

Tests Statistical analysis	sample differences				T	Df	sig	Statistical significance
	mean	Std .D	Std. error	95%confidence interval of the				

				mean difference is					
				Lower	Upper				
10 m	0.950	0.043	0.009	0.074	0.115	9.66	19	0.00	Ss
20m	0.068	0.015	0.052	0.116	0.531	5.58	19	0.00	Ss
4×10	0.156	0.134	0.029	0.093	0.218	5.20	19	0.00	Ss

Source:spss, 2022

A table showing the results of the pre and post-tests for the control sample at the significance level of 0.05 and the degree of freedom of 19.

It is clear from the table when comparing the results of the pre and post-tests of the control sample that the probability t value of the speed tests (starting speed 10 m, transitional speed 20 m, endurance speed 4 x 10 m) has reached, respectively (0.000, 0.000, 0.000), which is smaller than the error rate. 5% and the degree of freedom is 19. Therefore, there are statistically significant differences between the pre and post-measurements of the control sample in favour of the post-tests.

8.3 Presenting and solving the results of the pre and post-tests of the experimental sample:

STAT Tests	Pre-test for the experimental sample		Post-test of the experimental sample	
	mean	Std .Deviation	mean	Std .Deviation
10 m	2.388	0.149	2.206	0.137
20 m	3.977	0.245	3.697	0.203
4×10	10.86	0.455	10.470	0.418

TestsStatistical analysis	sample differences					T	Df	Sig	Statistical significance
	mean	Std .D	Std. error mean	95%confidence interval of the difference is					
				Lower	Upper				
10 m	0.181	0.060	0.013	0.153	0.210	13.3	19	0.0	Ss

20m	0.280	0.899	0.201	0.237	0.322	13.9	19	0.0	Ss
4×10	0.395	0.215	0.481	0.294	0.496	8.21	19	0.0	Ss

Source:spss, 2022

A table showing the results of the pre and post-tests for the experimental sample at the significance level of 0.05 and the degree of freedom of 19.

It is clear from the table when comparing the results of the pre and post-tests of the experimental sample that the probability T value of the speed tests (starting speed 10 m, transitional speed 20 m, endurance speed 4 x 10 m) respectively amounted to (0.000, 0.000, 0.000), which is less than the error rate 5 %, and the degree of freedom is 19.

Thus, there are statistically significant differences between the pre and post-test of the experimental sample in favour of the post-test.

8.4 Presentation and analysis of the results of the post-test of the control and experimental sample:

Statistics	Post-test of the control sample		Post-test of the experimental sample	
Tests	Mean	Std .Deviation	Mean	Std .Deviation
10 m	2.343	0.179	2.206	0.137
20 m	3.865	0.272	3.697	0.203
4×10	10.81	0.117	10.470	0.418

Statistical study		Levin's test		t-test for equality of means					Statisticalsignificance
Tests		F	Sig	T test	Df	Sig	Mean . D	Std. Deviation. D	
10 m	e.	1.250	0.271	2.69	38	0.01	0.136	0.505	SS
20m	e.	1.644	0.208	2.21	38	0.03	0.168	0.0760	SS
4×10 m	e.	0.779	0.383	2.30	38	0.027	0.346	0.150	SS

Source:spss, 2022

A table showing the results of the post-tests for the control sample and the experimental sample at the significance level of 0.05 and the degree of freedom of 38.

It is clear from the table when comparing the results of the dimensional tests of the control sample and the experimental sample that the probability t value of the speed tests (starting speed 10m, transitional speed 20m, endurance speed 4×10m) amounted, respectively (0.01, 0.03, 0.027), which is less than the error rate. 5%, and the degree of freedom is 38. Therefore, there are statistically significant differences between the dimensional measurements of the two samples in favor of the experimental sample. A better improvement for the players. The Mean are less than the Mean of the control sample.

9. Presentation and discussion of the research results:

9.1 First Hypothesis:

Where the researcher assumed that training with small-sided games (the proposed training program) is effective in developing the starting speed of football players less than 15 years old. The results showed the validity of this hypothesis, as we found that there is a development in the level of cruising speed.

The researcher attributed this to the effect of the small-sided games exercises that are similar to the official match, the speed of counterattacks, and the speed of returning to the defence, which contributed to the development of the starting speed. This goes in accordance with what Sadoqi reached. (Sadoqi , alali, & alaoui, 2022)who found an advantage in improving the starting speed and agility of the group. The experimental view is due to the effect of the proposed training program with small-sided games. Therefore, it can be said that training with small-sided games (the proposed training program) effectively contributed to the development of the starting speed of the players of the experimental sample, and therefore the first hypothesis has been confirmed.

9.2 The second hypothesis:

Where the researcher hypothesized that training with small-sided games (the proposed training program) is effective in developing the transitional speed of football players less than 15 years old. The results showed the validity of this hypothesis, as we found that there is progress in the level of transitional velocity.

The training program applied in the way of small-sided games, to which the experimental sample was subjected, made the most significant differences between the results of the pre and post-tests of the transitional speed test (20 m speed test), which are statistically significant. This is consistent with the results that came in studies done by.(Katis & Kellis, 2009)

Therefore, it can be said that training with small-sided games (the proposed training program) effectively contributed to the development of the transitional speed of the players of the experimental sample, and therefore the second hypothesis has been confirmed.

9.3 Third Hypothesis:

small-sided games training (the proposed training program) is effective in developing the speed and endurance of football players less than 15 years old.

The researcher attributes this development achieved by the research sample to the effectiveness of the program with small-sided games as qualitative exercises similar to what happens in the matches, which were formulated and built on scientific foundations in the field of modern sports training, and this goes along with the results of the study done by(Faglouli, 2011) “The exercises integrated with the ball affect positively. Develop some physiological endurance velocity capabilities; thus, the third hypothesis was confirmed.

9.4 Fourth Hypothesis:

There are statistically significant differences between the results of the post-test of the control and experimental sample in the obese characteristics of the experimental sample; thus, confirming the results of Vermeulen who stated that: "training on mini-courts helps in developing rapid and continuous transformation through collective performance, in addition to developing agility, speed of reaction and accuracy of performance because it depends on the dynamics of a group playing performance that is similar during matches, as this leads to the promotion and improvement of the efficiency of skills and achieve stability and stability of the stages of technical performance of the special skill in the changing situations within the match.(Vermeulen, 2004, p. 23)

Therefore, it can be said that training with small-sided games (the proposed training program) effectively contributed to the development of the speed of the

players in the experimental sample, better than the traditional training of the control sample, and therefore the fourth hypothesis has been achieved.

10.Conclusion:

Within the limits of the research procedures, and in light of its objectives and through statistical analysis of the results obtained, the following conclusions were reached:

-Training with small-sided games positively affects the development of speed (starting speed 10 m, transitional speed 20 m, endurance 4 x 10 m). These exercises are based on the style of competitions, which is one of the best methods of stimulating the activity of young players, which creates a physical burden and real competition.

-Programming training according to scientific foundations and principles with the content of traditional exercises is not enough to bring the player to the highest levels.

-There are statistically significant differences between the post-tests of the two samples, which are for the experimental sample, training with small-sided games at the degree of freedom of 38 and the significance level of 0.05 for the physical tests of speed (starting speed 10m, transitional speed 20m, endurance speed 4×10m).

Depending on the data we collected through this study and based on the conclusions drawn, and within the framework of the study, the researcher makes the following recommendations:

-The necessity of using small-sided games exercises in training programs for the youngest because of their positive impact on the development of physical attributes.

-Use exercises that are consistent with the nature and direction of performance as occurs during competitions.

-Analyzing the performance of players in international level competitions in order to extract new playing situations.

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