

The impact of an intermittent training program on maximum aerobic speed (VMA) and speed-related strength in senior football players

تأثير برنامج تدريبي متقطع على السرعة الهوائية القصوى (VMA) والقوة المميزة بالسرعة لدى لاعبي كرة القدم أكابر

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Abstract:

This study aimed to find out the effect of a training program proposed by the method of intermittent training on the characteristics of maximum aerobic speed and strength characteristic of speed for senior football players. The research sample consisted of 24 players from the Najm Birgballo team, active in the first regional of the Algerian Regional League, and the members of the research sample were divided into Two samples, experimental and control, where each sample contained 12 players. Physical tests (Navat and Sargent's vertical jump test) were relied upon as tools for the study. The experimental approach was adopted with the analysis of the data collected using statistical methods, including the Student test, the arithmetic mean, and Pearson. The results concluded that training Intermittent exercise affected the development of strength characterized by speed and maximum aerobic speed for the experimental group in better proportions than the control group.

Keywords: intermittent training, strength characteristic by speed, maximum aerobic speed, Football, Seniors.

ملخص:

هدفت هذه الدراسة إلى معرفة أثر برنامج تدريبي مقترح بطريقة التدريب المتقطع على صفتي السرعة الهوائية القصوى والقوة المميزة بالسرعة للاعبين كرة القدم أكابر، حيث تكونت عينة البحث من 24 لاعب من فريق نجم بفرغبالو الناشط في الجهوي الأول للرابطة الجهوية للجزائر، وقسمت عينة البحث إلى عيّنتين تجريبية وضابطة، احتوت كل عينة على 12 لاعب، وتم الاعتماد كأدوات للدراسة على الاختبارات البدنية (نافات، وسارجنت للقفز العمودي)، وتم اعتماد المنهج التجريبي مع تحليل المعطيات المحصلة باستعمال الوسائل الإحصائية كا اختبار ستودنت، المتوسط الحسابي، بيرسون،

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وخلصت النتائج أن للتدريب المتقطع أثر على تطوير القوة المميزة بالسرعة والسرعة الهوائية القصوى بالنسبة للمجموعة التجريبية بنسب أحسن من المجموعة الضابطة.
كلمات مفتاحية: التدريب المتقطع، القوة المميزة بالسرعة، السرعة الهوائية القصوى، كرة القدم، الفئة العمرية أكابر.

I -Introduction:

The time has passed when some coaches were able to bring talented athletes to the high level and rely on their field experiences and individual expertise. Today, it is difficult to reach the prestigious high level in the field of sports, especially football, unless sports planning is done based on solid scientific foundations in the field of sports training. Modern, and this started from selecting and choosing talented people and adopting them during the stages of formation and training, as well as preparing training programs until providing human material capabilities and overcoming all obstacles that face the process of progress and reaching high levels. (Wei neck,1986, p309)

Sports training is considered one of the modern sciences that has achieved great progress through its connection with other sciences and benefiting from its theory, laws and research results. Sports training aims to develop the abilities of athletes to achieve achievement and reach the highest levels, and muscular strength is one of the physical qualities and abilities that play a role in most sports games and events. Individual and collective, where general and compound muscular strength constitutes the main part in successfully achieving mastery and accuracy of skill performance (Jassim et al., 2016, p. 1323)

This is because the player who is not physically prepared for the competition level shows fatigue and this causes him to lose the ball frequently in addition to weak tactical thinking. Unlike the player who is physically prepared, he ends the match as he started it with control of the ball and proper thinking during the various stages of skillful and tactical performance and with accuracy. The maximum air speed and strength characterized by speed are considered one of the best physical characteristic of Soccer players, as it is a combination of strength and speed that the player exerts to perform a physical effort characterized by high strength and speed.

Football, like other various sports disciplines, has received its share of experiences that helped to find the most important factors that must be paid

attention to and focused on in order to reach the high level. Sports training has become several different methods and approaches, and each method has its principles, goals and methods that every coach must know and distinguish. Among them in order to reach high levels or achieve the desired goals. Among these methods there is the method of intermittent training, which is of great importance in modern sports training in general and physical preparation in particular.

This training method, which was developed by many scientists, was able to demonstrate the quality of the level of physical performance that can be developed, as it combines periods of work followed by periods of rest, and regardless of the goals of intermittent training, it is directed at developing the aerobic side, such as endurance, or the anaerobic side, such as speed endurance, or the anaerobic side. Non-structural power is characterized by speed and explosive power. (Abdul Basir Ali, 1999, p. 98)

Interval training is also a training method that contains an important form of improving maximum aerobic capacity in team sports through mixed aerobic-anaerobic energy stimulation (Dellal, 2013, p. 14), which is an alternating effort of high intensity that allows for the amelioration of max O₂ consumption and the amelioration of anaerobic amplitude. Hervé also pointed out that short interval training at a speed similar to maximum aerobic speed clearly stimulates and develops the aerobic system, (Cometti et, Hervé 2007).

Through our follow-up of football events at various international levels and tournaments, we noticed that the player's physical level, especially with regard to maximum air speed and muscular strength, has a major role in scoring many goals and saving many opportunities, as it has allowed many international stars to implement their various skills with ease, accuracy and beauty. The opposite is true for our local championship, as the researcher noticed that the Algerian championship players at various levels lacked such qualities that often made the difference, which led us to raise many questions, since players cannot perform the various skills related to football unless they possess a certain level. From muscular strength and maximum aerobic speed, and considering the method or interval training method to be one of the most dynamic methods in ameliorating these physical characteristics, the idea of our study came from it and the following general question was:

What is the Impact of exercise using interval training on developing force speed?

Question

-Do exercises performed using the interval training method have an effect on improving the speed-related strength of football players?

-Do exercises programmed in the intermittent method affect the improvement of VAM of football players?

Hypotheses

The proposed program use an intermittent training way to ameliorate the force speed and maximum aerobic speed in football players

- Exercises carried out using the interval training method have an impact on improving the strength and speed of football players.

- Exercises performed using the interval training have an effect on ameliorating VAM of soccer players.

terminology and definitions

- Interval training

It is a form of modern physical training, in which some modern methods and resistance exercises are used and aims to increase physical capabilities. It is defined as the method that aims to improve physical fitness in a continuous and varied manner by performing functional physical movements at high intensity. (smith.mm.sommer, AJ Starkoff, 2013)

- Force speed

the ability of the nervous system to produce quick force This means that there is an integration and linking of the two attributes of force and speed into one component or attribute, that is, achieving and executing movements is done in coordination between the two components of force and speed at the same time. (Abdel Fattah, Sayed, 1993, P 163)

- vam

the speed at which the athlete reaches max O₂ consumption as a result of aerobic endurance training (Allawi, 1992, p. 213).

- Football

It is a game played between two teams, each team consisting of 11 players. Each player kick the ball toward the opponent's side to score. The ball is touched with the head and foot, and only the goalkeeper is allowed to touch the ball with his hand inside his area, which is known as the penalty area (Farhat, (1996, p. 217)

II – Method and Materials

Method

Given the nature of our research, which proposes special exercises that will be tested on a sample of 24 players, the appropriate approach for our study is the experimental approach.

The Sample

Research population

The population

The study population represented group of units from which the sample selected. (Sherbini et al., 2012, p. 155). In this study, the research population consisted of soccer players active in Section Four in Algeria.

The research sample and how to choose it: It means the method of collecting data and information from and about specific elements and cases that are selected in a specific manner from all the elements of the study's vocabulary and population in a way that serves, is consistent, and works to achieve the base of search. Twenty-four players were chosen as a sample, divided into two equal and homogeneous groups, in each group 12 players from the Bir Agbalu star team. The sample was chosen intentionally.

Table N. 01: shown the coefficient of variation in age, height, weight, training age.

Variables	CV
age	0.27
height	0.23
weight	0.24
Training age	0.07

Analysis

The CV for all variables does not exceed 0.30, this indicates that there is homogeneity between the two groups.

Homogeneity

Means that the values do not differ from their mean by large distances.

According to the variables

T N 02 represents the Statistical, σ , and student scores for the variables of the two groups.

Variables	Experimental group	Control group	Calculated	Tabular T
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	x	S	x	S	T	
Age	23	0.56	22.36	0.68	0.56	
Length	179.06	4.01	175.86	4.96	0.39	
Weight	74.01	2.16	72	2.81	0.41	2.04
Training Age	2.96	0.51	2.72	0.52	0.11	
Force -speed	38.01	1.54	37.39	1.86	0.79	

Analysis

The results of the variables that the researcher relied on in studying the equivalence between the experimental (A) and the control (B), where the results showed that there were no statistically significant differences between them, so that we notice that the values are not far from their average, While the value of Studen's T was less than the tabulated T, at a significance level of 0.05 and a DF of 30, from which we conclude that there is equality between the two groups.

Determine the factors:

Independent: It is the factor that the researcher assumes is the cause for a certain result, and studying it may lead to knowing its effect on another factors.

Dependent: It is the factor that changes as a result of the influence of the independent variable. (hassan, Ratib, 1999, p. 219).

In our study, the factors were as follows:

The independent: the intermittent training Program.

Dependent variable 1 Maximum air speed.

Dependent variable 2. Power distinguished by speed.

search tools:

The tools used were as follows:

Suggested exercises within the program: The researchers applied the suggested exercises using an interval training method within the allotted period.

Tests

Sargent Vertical Jump:

The aim: to measure the force speed.

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Description: The player holds a piece of chalk, then extends the arm high to the maximum extent and marks on the wall, then stands on the line drawn on the floor with the side facing the wall. He bends the knees and swings the free arm, then pushes with the force of the jump. After the signal he jump to reach the highest possible point. Number of attempts: 03.

Recording the score

Measure the distance between the first and second signal, the number is recorded, and 03 attempts are given to the player, counting the best.

(Kharbit, 1989, p. 38).

Navat test:

Purpose of the test

to measure aerobic capacity (maximum aerobic speed).

Test performance description:

- The warm-up is performed for 10 to 15 minutes, in order to prepare the body for the next activity.
- A specific sound signal is generated. It should be placed at a point where it can be clearly heard.
- The test site should be flat and without obstructions. In addition, transportation will take place from one point to another, which will be a distance of 20 meters.
- The first stages are carried out in a gentle rhythm, because it is about getting used to the test little by little.
- The test will end when the practitioner stops due to reaching maximum performance, or when he is unable to reach the line..

the score: The test stops when the player can not reach the next level after the whistle and his VMA is determined based on the last distance reached.

Main experience:

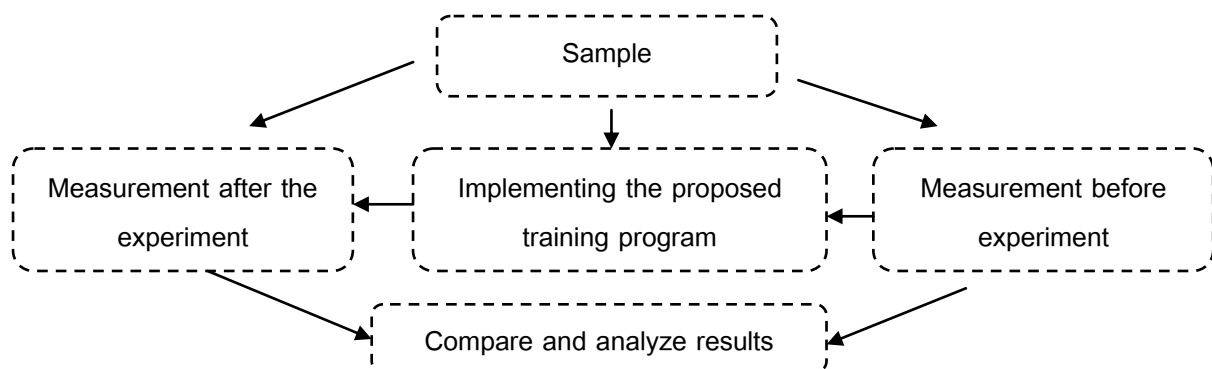


Figure (01): represents an illustrative diagram of the main experiment of the study's progress on the research sample

Statistics

μ: It is the sum of a group of values divided by their number (Al-Janabi, Al-Shawi, 2015, p. 101).

CV: The ratio between the standard deviation and the arithmetic mean. (Jalato Djilali, 2012, p. 100)

-Standard deviation

It is calculated to determine the convergence or divergence of the group results from its mean.

-Student t-test

It is a statistical method used to calculate the differences between arithmetic averages and is used to accept or reject the null. (Al-Jadi, Abu Helou, 2009, p. 424).

-percentage. -Pearson correlation coefficient, honesty coefficient

III – Results

present vertical jump test results from stability

Table N. three: represents the results of the pre- and post-physical test for Force speed.

Group	Pre-test		Post-test		Calculated T test	Tabular T test	Statistical significance
	x	S	x	S			
Groupe A	37.01	1.25	39.24	1.71	3.25	2.06	significant
Group B	35.22	1.39	34.64	1.28	0.64		Non-significant

Present Navat maximum airspeed test results

Table N. Four: showing the results of the pre- and post-physical test for vam.

Group	Pre-test		Post-test		Calculated T test	Tabular T test	Statistical significance
	x	S	x	S			
Groupe A	15.3	0.63	15.96	0.66	3.86	2.06	significant
Group B	15.12	0.61	15.25	0.63	2.96		Non-significant

IV – Discussion:

For the Sargent vertical jump test to measure force versus speed:

Through statistical analysis, it appears that the arithmetic mean in the post-measurement (39.24) is greater than the pre-measurement (37.01), and the

calculated t- value was greater than the tabulated t- value for the experimental group, and after reviewing the statistical significance table for the T-test, since the calculated t is larger. From the tabulated t, the matter indicated that there were statistical differences between the pre and post measurements of the experimental group, while the results of the control group showed that the arithmetic means were close, while the calculated t was smaller than the tabulated t. After tabular review, it was found that there were no statistically significant differences between Pre and post measurements for the control group.

Navat test

Through statistical analysis, it appears that the arithmetic mean in the post-measurement (15.96) is greater than the pre-measurement (15.3), and the calculated T value was greater than the tabulated T value for the experimental group, and after reviewing the statistical significance table for the T-test, since the calculated T-test is larger. From the tabulated t, the matter indicated that there were statistical differences between the pre and post measurements of the experimental group, while the results of the control group showed that the μ were close, while the calculated t was also greater than the tabulated t. After tabular review, it was found that there were statistically significant differences between The pre- and post-measurements were for the control group, but the rates of progress achieved between the two groups were greater for the group that trained using the intermittent training method.

Through all of the above and in light of the results of this study, the impact of the exercises proposed through the intermittent training was revealed on both the VAM and the Force-speed among soccer players, and after presenting and analyzing the results of the measurements of the selected

physical tests for the control and experimental groups. A number of conclusions were reached as follows:

-The two groups, after conducting the pre-tests, had the same level in each of the strength characteristics characterized by speed and maximum air speed.

After conducting the post-tests, it was found that there were statistically significant differences in the pre- and post-measurements in favor of the post-measurement for the experimental group that underwent the proposed exercise program in the vertical jump test for strength characterized by speed, while there were no statistically significant differences for the group that was not subjected to the proposed program. With regard to maximum aerobic speed, both groups showed statistically significant differences, with a difference in the rates of current development relative to the experimental group that underwent the proposed training program.

From the results presented above, we conclude that intermittent training has a major impact and role in improving strength characterized by speed and maximum aerobic speed.

- The necessity of relying on physical tests to know the abilities of athletes and to build the construction the training programs.
- The necessity of relying on the intermittent training as an effective way in developing the physical abilities of football players.
- Taking into account all circumstances and variables that affect the training process directly or indirectly.
- It is necessary to inform trainers of modern training methods and conduct various training courses.

V – Conclusion

Through all of the above and in light of the results of this study, the effect of exercises in the proposed intermittent method on the strength characterized by speed and maximum aerobic speed of soccer players was revealed. After

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presenting and analyzing the results of the measurements of the physical tests for the control and experimental groups and discussing those results, it became clear that the training method Intermittent training has a significant and significant impact on improving the physical performance of the football player, not only at the level of the studied attributes, but also on other attributes and abilities that may be the subject of study in the same context. Therefore, researchers recommend the importance of expanding the scope of research in this field.

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