



# THE EFFECT OF BALLISTIC EXERCISES AND ELECTRICAL STIMULATION IN THE DEVELOPMENT OF STRENGTH FEATURED OF SPEED AND LEVEL OF ACHIEVEMENT IN THE EFFECTIVENESS OF 110 HURDLES

Dr. Ansam Khazaal Jabbar

College of Physical Education and Sports Sciences

Basrah University 2022

[anssam.kazal@uobasrah.edu.iq](mailto:anssam.kazal@uobasrah.edu.iq)

## Abstract

The research aims to prepare a curriculum that includes physical exercises, electrical stimulation and the research sample. And knowing the impact of the curriculum on the level of achievement of strength Featured of speed and level of achievement in the effectiveness of 110 hurdles for young. The researcher used the experimental curriculum, the two Basra youth team was chosen in the event of 110 barriers, which number (12) runners in the intentional way, and they are between (16-19) years old. The researcher used the following tests, muscle layout test using the EMG device, the speed tested of the arms and the two legs of achievement in the effectiveness of 110 hurdles , and after obtaining the results it was statistically addressed, so the researcher obtained the following conclusions that the proposed method (electrical and ballistic stimulation) has an impact on development The muscles to measure EMG (Dalia, with the three heads) as they showed moral differences and in favor of the post -test. The proposed training method (electrical and ballistic stimulation) has an impact on the development of the force that is characterized by speed. The training method (electrical and ballistic stimulation) has an effect on developing the level of strength Featured of speed and level of achievement in the effectiveness of 110 hurdles. As for the most important recommendations: the necessity of adopting the proposed training method in training all players from various sports because it has proven its effectiveness and importance in training. And the necessity of using this method is the beginning of the training unit immediately after warming.

## 1- Definition of Research:

### 1-1 Introduction Research and importance:

The higher levels and their achievement seek everyone in all sports fields, especially athletics, so the trainers sought to find modern scientific methods for sports training. Ballistic exercises are an important training method that depends on the central and trauma contracting, and these exercises are the ones that enable



the muscle to reach the maximum length in a short time. These exercises are also used to develop muscle capacity. Electrical motivation as training is made against fixed resistance. It is electrical training, and when combining these two types of ballistic training and electrical stimulation, strength and speed the effectiveness of 110 hurdles of individual games that require physical and special skill preparation in order to raise the efficiency and ability of hostility in the park In the transition and strength in jumping to cross the barrier, the speed and strength when integrating is the distinctive force with the speed that hostility needs from the beginning of the race until the finish line crosses, hence the importance of research in the use of ballistic exercises and electrical motivation to develop the level of achievement among hostiles the effectiveness of 110 hurdles.

### **1-2 Research Problem:**

The research problem is that some traditional training programs and programs may not give the required value from the development of the level of important physical characteristics in performance, as the activities of the short pants, including effectiveness of 110 hurdles that need to be strengthened for the muscles of the men and the speed of performance, so the researcher has prepared the ballistic exercises associated with electrical stimulation in order to develop physical qualities The task in the effectiveness and the crossing of barriers. Despite the multiplicity of training methods in developing the distinctive strength of speed, electrical stimulation with ballistic exercises is a new and modern idea and style, and its effects have not yet been known. Therefore, the researcher deliberately went through such an experiment to integrate (electrical and ballistic motivation) to know the extent of its impact on developing of strength Featured of speed and level of achievement in the effectiveness of 110 hurdles

### **1-3 Research Objectives:**

- 1- Preparing exercises (highway and electrical stimulation) in developing of strength Featured of speed and level of achievement in the effectiveness of 110 hurdles.
- 2- Identify the effect of exercises (ballistic and electrical stimulation) in developing of strength Featured of speed and level of achievement in the effectiveness of 110 hurdles



### **1-4 Research Hypotheses:**

1- There are statistically significant moral differences between tribal and post-tests in the force that is characterized by speed and the level of achievement in the effectiveness of 110 hurdles.

### **1-5 Research fields:**

**1-5-1 human field:** Players of the youth team of Basra Governorate in of effectiveness of 110 hurdles.

**1-5-2 time field:** For the period from 24/6/2022 to 12/9/2022.

**1-5-3 Spatial Area :** field and halls of the Faculty of Physical Education and Sports Sciences, Basra University / Faculty of Medicine, Basra University / Consulting Center.

**Keywords:** Ballistic exercises, Electrical stimulation, effectiveness of 110 hurdles.

### **2-Research Approach and Field Procedures:**

#### **2-1 Research Approach:**

The researcher used the experimental curriculum in the style of one experimental group with two tribal and post -testing to suit the nature of the research

#### **2-2 Research sample:**

The players of were chosen from the young Basra national team, who number (12) runners in the intentional way, and they are between the ages of (16-19) years.

#### **2-3 the devices and tools used in the research:**

- 1- Arab and foreign sources.
- 2- Plaster tape.
- 3- Medical cotton.
- 4- Surface stations.
- 5- Rubber blades.
- 6- Medical alcohol.
- 7- Rubber tape.
- 8- Starting of 110 barriers.
- 9- Legal jumping barriers No. 12.
- 10- EMG.
- 11- DEL computer.



- 12- Motivating devices (6).
- 13- Medical balls.
- 14- Wooden boxes for jumping.
- 15- A chair to throw a medical ball.

## **2-4 Research tests:**

### **2-4-1- Muscle layout test using EMG**

#### **A- Surface decentralization:** (Muhammad Subhi : 1987)

Laying superficial poles over the middle of the muscle, which are the shoulder and the three heads of the right or left arm, according to the player's striking arm, and after shaving the hair from the surface of the skin to reduce the skin's resistance to electrical signals and get an EMG signal, then paste the tulips on the top of the middle of the muscle and there is an additional drop One for the device works to remove the electricity that the body picks up from the ocean and is called the ground land and to determine the movement of the wires and put a tape on it on the wires to fix the arm and around the waist.

#### **B- Myo Research XP 1.06.67** (Risan Khreibet Majeed, & Ali Turki Musleh :2002)

This program carries on the computer and it is the duty of this program to display the EMG signal and stored it the name of the muscle, and it can make this several treatments for this sign later (linear packaging, and the average RMS Root).

#### **C- EMG operation**

This device works to receive the muscle electrical with the wires that connect it and the poles above the muscle and this device sends the EMG signal in the form of a remote Bluetooth signal to the reception device.

#### **D- EMG signal analysis**

This process is carried out in two ways: (Basmajian:1985)

\* The average movement (moving average): This depends on the researcher who determines the time of the window, with a certain amount of data specifies from which the calculation is extracted using the sliding window style and building from it in guessing the capacity of the capacity (SENIAM) and has a relationship with the information related to the area under the curve Selected from.



\* The average of the Spring Root (RMS): This method depends on the calculation of the average square root, as RMS indicates the average capacity of the signal with the selection of the capacity with curved lines, which makes the sign easy to display and this method is useful in studying the timing. It is generated by a voluntary stimulating muscle.

These two measurements provide useful information about the signal capacity and prefer when registering an EMG signal from voluntary contractions, and the signal uses the values of the Root Root rate (RMS) because of its careful representation of the period of the signal and this has a clear physical meaning. (Deluca, C.P: 1997)

The researcher used the method of calculating the activity of the work of the deliberate muscle in decentralized contraction and calculating the area of the three -head muscle activity in its central shrinkage, summit and area, which are among the variables under research.

#### **2-4-2- Test strength Featured speed of arms (10 sec): (Bastwaisi Ahmed: 1999)**

The goal of the test: measuring the strength of the speed of the arms.

Tools: timing watch.

Performance specifications: from the inclined lying mode (the number of bending and extending the arms in 10 sec).

Method of registration: Calculate the number of times and extend the arms during the 10 seconds.

#### **2-4-3- Test of strength Featured speed of legs: (Ali Sadiq Dhiab: 2011)**

Test Name: - Running Test by Jumping (5) steps.

The purpose of the test: - Measure the strength of the speed of the two men.

Tools used: flat ground, tape measure.

Performance specifications:- The starting line draws next to the side line of the stadium and the player stands behind the starting line so that one of the feet is on the front and the other in the back, then he begins to fill forward by pushing the man's reliance and landing on the plaintiffs of the front (i.e. from the right to the left or vice versa) With the repetition of these jokes so that it falls with the fifth sheet with the two men together.

Registration:- The best distance achieved by the player is calculated in two attempts to the nearest centimeter, so that the distance is measured by the nearest impact that the player leaves in his fifth fix.

**2-4-4 Test of running of 110 hurdles.****2-5 Field research procedures:****2-5-1 Exploited Experience:**

The researcher deliberately conducted the exploratory experiment on a sample of 2 players from the original research sample on 6/6/2022 at five in the afternoon, as the deltoid muscle and the three-headed muscle were measured in the EMG device in the Faculty of Medicine Labs of the University of Basra and then measured the skill physical tests in the track The Faculty of Physical Education and Sports Sciences to ensure the validity of the tests and to determine the most important obstacles that may object to the researcher.

**2-5-2 Tribal tests:**

It was conducted on Tuesday 27/6/2022 on the research sample.

**2-5--3 Main experience:**

The main experience started on 29/6/2022 and ended on 9/8/2022.

- The duration of the use of exercises is 8 weeks, with 3 training units per week, and the total number of units was 24 appendix units (1).
- Electrical stimulation and ballistic exercises were used.
- Exercise implementation period (20-30) minutes.
- Exercises were given during the special numbers stage.
- The intensity was determined by relying on the boxes used by training and its height, which ranged between (35-50) cm and also relied on the type of exercise and the distance cut when performing (partition, jump).
- The researcher took into account the principle of gradual size.
- The researcher took into account the existence of comfort between the training units, groups and repetitions, as the researcher deliberately working to rest (1: 3) and (1: 5) or between the repetitions, so the period of rest is (5-10).
- The researcher used the principle of gradient in the number of repetitions, as the repetitions of the muscles of the two men (6-15) and in groups (1-5) ranged.
- The researcher used electrical stimulus immediately after warm up, so that the stimulation area is active and the amount of blood that is connected to it is sufficient to feed the muscle during the stimulation process. And then its procedure for the overcoming muscle and the three heads.
- Electrical stimulation time ranged between (6-10) minutes.

**2-5--3-1- Ballistic Exercises:**

1. The vertical ejaculation of the medical ball with both arms
2. The side jump on the box up and down
3. The barrier jumped sideways
4. Zakakaki jump
5. Cut the squatting jump
6. Jumping on the episodes
7. Jumping the box forward
8. Squatting jumped
9. Ascending and going down on a box with a height of (20-50) cm on the right side, then to the left side
10. Deep jumping
11. Jumping the box from the squatting mode
12. The partition is on one foot
13. Jumping forward over the hurdles with both feet.

**2-5-4 POST - Tests:**

Post -tests were performed on 9/10/2022 with an attempt to apply the same conditions for the tribal test.

**2-6 Statistical means:**

The researcher used statistical means within the (SPSS / Ver / 19) program

**3- View, Analysis and Discussion of the Results:**

**3-1 Display and discussion of the muscular activity variables of electrical stimulation in the septum upgrading stage.**

**Table (1)**

**Shows the calculations and standard deviations of the variables**

Electrical activity variables	measuring unit	Muscle	Tribal test		Post test		T collected	T table	Significance of differences
			M	S	M	S			
Electrical summit	Microvolt	deltoid muscle	808,58	417,26	577,68	481,2	2,7	1.796	moral
		three-headed	482,6	254,4	490,52	276,2	3,41		moral
	Microvolt	deltoid muscle	291,3	161,06	184,4	162,7	2,76		moral



Average of the Spring Root (RMS)		three-headed	187,7	95,4	203,2	171,6 4	4,5		moral
Muscle activity space	Microvolt /Sec	deltoid muscle	152,8	79,214	105,9	91,1	2,69		moral
		three-headed	85,5	50,6	80,38	45,38	3,6		moral

**Below the level of significance (0. 0 5) and the degree of freedom 11**

From Table (1) it shows that all EMG measurements in the electrical stimulation of the dual muscles and three heads. It is significantly significant and in favor of the post -test, and this indicates that training by electrical and ballistic stimulation has a significant impact on the muscles. The researcher attributes that development to the method of electrical stimulation in an organized way that helped in developing the largest number of kinetic units of the stimulating muscle, as the fast fibers have been stimulated and this is consistent with Martin and others. Nerve ends of the large kinetic neuron that needs a low sample of excitement to activate it more quickly. (Martin: 1993) (Muhammad Hassan Allawi & Abu Al -Ela Ahmed Abdel -Fattah: 2000) notes, "The electrical stimulation is characterized by its capabilities to recruit all the muscle fibers to contract in one go, and this does not happen during the voluntary contraction where there is always a part of the muscle fibers that has not yet been contracted and this part is called (Reserve power).

### 3-2 Display and discussion of skill and physical variables:

**Table (2)**

**Shows the computational circles and standard deviations of the variables of the septum upgrading, the characteristic of the force that is characterized by speed and the level of performance at the event of 110 hurdles**

variable	Measuring unit	Tribal test		Post test		T collected	T table	Significance of differences
		M	S	M	S			
Raising the barrier	degree	17.26	3.719	20.652	3.024	7.358		moral





Speed tested at the speed of the arms	repeat	8.1	0.875	11	0.816	16.155	1.796	moral
Speed strength test for the two men	meter	5.5	0.745	6.57	0,618	6.781		moral
Achievement test	Sec	16.32	0.987	15.10	0.543	8.765		moral

From Table (2) it is clear that all skill or physical tests have emerged between tribal and post- tests and in favor of the dimension. The researcher attributes this to the effect of the use of the training method (electrical and plastic stimulation), which applied for 8 weeks that improved the out grade of the barrier, and therefore improved performance level is the effectiveness of 110 hurdles needs strength and speed and that the integration of the method of (electrical stimulation, ballistic) generates strength and speed and confirmed that ( Bastweisi: 1996) "Pallasty exercises are one of the important and important pillars that affect the progress of the athlete (achievement) level along with (technique), as these exercises positively affect the level of technique, and thus affected the achievement.

The researcher used these exercises in the special preparation phase, that is, before the tournament in order to raise the completion, and this proves that "the implementation of such exercises must be taken into account and that they should be before the competitions for a sufficient period, that is, during the period of special numbers so that the athlete can reach the excessive compensation stage." (Marwan Majeed & Muhammad Al -Yasiri : 2004).

The implementation of this method during the special preparation period contributed to the development of the distinctive force at speed, as (Kosszov: 1972) indicates "the importance of skill training and the development of strength in the period of special physical preparation, as the force must be made in different forms and amounts and corresponds to the performance of the skill, and that the development The strength depends on rapid changes to the rhythm of nerve signals, as muscle activity is characterized by a high degree of compatibility



between the time of the size of the nerve signals, as it indicates the importance of this force through performance exercises that are the main means of developing them. (Mamdouh Shennawi, 2003).

#### **4- Conclusions and Recommendations:**

##### **4-1 conclusions:**

- 1- Suggested exercises (electrical & ballistic stimulation) have an effect on muscle development to measure EMG (Dalia, with three heads), as they showed moral differences and in favor of the post-test.
- 2- The proposed exercises (Ballistic& electrical stimulation) has an effect on developing the distinctive strength of speed.
- 3- The method of exercises (electrical stimulation) has an effect on improving the level of performance in the stage of raising the barrier and thus improving performance in general.

##### **4-2 Recommendations**

- 1- The necessity of adopting the proposed exercise style in training various sports because it has proven its effectiveness and importance in training.
- 2- The necessity of training in electrical motivation with the principle of individualism, as the players 'ability should be known during the use of stimulation.
- 3- The necessity of using this method by electrical motivation, the beginning of the training unit, immediately after warming.
- 4- The necessity of conducting similar studies on other samples and other mathematical games.

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**Appendix (1) Exercise training unit model used in the main branch**

No	week	Training vocabulary	Training intensity %	repeat	Rest	groups	Rest Between groups
1	First	Getting exercises on the hurdles of the two legs together	75	6	4:1	2	4-3 Sec
2		Plyometric (Training method)	80	8	5:1	3	4-3Sec
3		Run on the shape and jump of 30 meters	80	6	5:1	2	5-3Sec
4		Hit the medical ball violently to the bottom	75	8	4:1	2	5 Sec
1	Fifth	Medical balls training in the legs and arms	80	4	5:1	2	5 Sec
2		Run in the shape and jump of 40 meters	85	3	6:1	2	5 Sec
3		Run on bar	90	10	6:1	3	6 Sec
4		Side of the medical ball shoot	80	4	5:1	3	6 Sec