

# THE EFFECT OF SPECIAL PLAUMETRIC EXERCISES TO DEVELOP EXPLOSIVE FORCE OF THE MUSCLE GROUP WORKING ON THE ANKLE JOINT OF YOUNG TAEKWONDO PLAYERS

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## ABSTRACT:

*The game of Taekwondo is one of the modern martial arts games. The game is characterized by its rapid and high speed. It consists of various offensive and defensive movements, which represent the skills of the game through which the two men and the hands are used in a consistent manner characterized by speed, strength, flexibility, agility and accuracy of performance. The two men are significantly compared to the hand, especially on the foot (ankle joint) to hit and score points, so the explosive force plays a positive role during beating and performing movements at a high level through the muscle groups of the ankle joint, Explosive strength and knowledge of how to train to give the ankle joint Strength during kicking and jumping during the downhill, as the athlete always seeks to continue the effectiveness of the level of fitness and strength to achieve a higher level of achievement, and training is an important and specialized scientific sciences, And the development of force in its forms and explosive power in particular to take advantage of during the humiliations of young players as well as the decisive blow that resolves the survival of the player who has the explosive power to kick and hit the opponent, as the training contributed to the building On the basis of scientific in the development and codification of training loads to be more appropriate to the ability of the body to endure and take advantage of the positive effects of the state of the functional body to provide the correct methods and programs to win during the local, international and global, where the number of sample (12) players represented by young players, The sample consisted of two equal groups, one of which was experimental and the other experimental. The researcher developed a series of strength exercises in the development of explosive force of the leg muscles using training tools and tools. The training period lasted 6 weeks with 3 units (15-20) minutes, weekly training days (Wednesday, Friday, Monday). The researcher concluded that the application of the strength exercises used has a positive effect on the strengthening of the ankle joint muscles in the experimental sample. This was evident through the tribal tests The researcher recommends the use of plaumetric exercises in the development of explosive force, which is effective in the performance of movements in order to determine the type of weakness of the muscles that need strengthening and the type of exercises required and intensity and frequency and duration of rest.*

**Keywords:** *plaumetric exercises - explosive force – taekwondo.*

## INTRODUCTION

"Taekwondo is one of the modern martial arts games. This game is characterized by its rapid and high-speed sports. There are several interpretations of the term taekwondo, which is often translated as a hand and foot method. This term consists of three sections:

.TAE = beating or handicap by foot or means kicking and also means jumping-

.KWON = Grip, punch or handicap by hand-

.DO = style method or art-

If we put these sections together, it means the art of kicking and punching or the art of fighting, and the game Taekwondo one of the most famous martial arts games, if the formation of the movements of offensive and defensive variety represent the skills of the game through which the use of both men and hands in a consistent manner characterized by speed and agility and accuracy of performance. "

Taekwondo is a full-fledged sport. It allows the kick to head and torso, but the punches are aimed at the trunk only. It is a sport that everyone can exercise. It does not specify a specific age or age. To distinguish between players. So you need to build strength properly by developing muscles and developing the explosive force of the group working on the ankle joint, which has the effect of jumping or kicking during the run or competitions. Therefore, the importance of the research in the preparation of special exercises in the way of Palyomtrak to develop the explosive power of the muscles of the leg because of the impact of beating rival and the recording points on the electronic protective worn by the competitor, which requires the strength of the strike as well as the knockout while directing the head of the player.

:Research problem

The researcher generated several questions on how to develop explosive force, weak working muscles and ligaments on the joint to improve the strength of the strike during the performance of movements in the Taekwondo game. Therefore, he decided to build a training curriculum that includes special ballistic exercises that will contribute to the development of the strength of the leg muscles to hit points as well as the strength of the strike while directing to the opponent.

research goals:

- Preparation of a proposed approach to the exercise of special plometric in the development of explosive force of the leg muscles of young Taekwondo players.

- To study the effect of the proposed method for special plometric exercises in developing explosive force of leg muscles for individuals of the research sample.

:Assuming the research

There are statistically significant differences between the results of the tribal and remote tests in the development of explosive force of the stem muscles of the research sample.

- There are statistically significant differences between the results of the control and experimental groups in the tribal and remote tests in the development of the explosive force of the leg muscles of young Taekwondo players.

Research Areas:

.Human Field: A sample of young Taekwondo players -

.Time domain: from 20/11/2018 to 20/2/2019 -

Spatial area: halls of the National Center for sports talent.

## MATERIALS AND METHODS:

### Research Methodology:

The researcher used the experimental method in designing the two control and experimental groups.

### Search community and sample:

The research community was determined in a deliberate manner and represents the community in the 12 national players of the National Taekwondo Center in Baghdad governorate. This sample was randomly divided into two equal groups. Each group consists of (6) players, one of them is an officer and the other is experimental. The percentage of the research sample (100%) is the proportion of the research community.

### Means of gathering information, tools and devices used in research:

:Devices used in research

Video device for camera with camera

A computer type (dell) computer

Second: Tools used in research:

Heavy iron bar (5 kg), (10 kg) and rubber bands (12)

Wooden boxes with different heights

Electronic stopwatch (1/100) second

:Information collection methods  
Arab sources and references.

### Field research procedures:

Vertical Jump Test of Stability:

The purpose of the test: Measure the explosive capacity of the two men in the vertical jump to the top. The necessary tools: a panel of wood width (0,5) m and length (1,5) m, draw lines and the distance between each line and the last 2 cm.

. A smooth wall of at least 3,60 m-

. Colored pen, cloth to clear marking marks-

Procedures: The blackboard or piece of wood shall be mounted on the wall with the bottom edge on the wall allowing the shortest laboratory to perform the test, and drawing a 30-cm long orthogonal line on the floor.

Performance description: The lab holds at least 2 cm of chalk and then stands facing the board and extends the

arms as high as possible and sets a chalk mark with a note adjacent to the two bumps of the ground. The laboratory stands facing the panel with the sides so that the feet are on the 30 cm line, as in Fig.

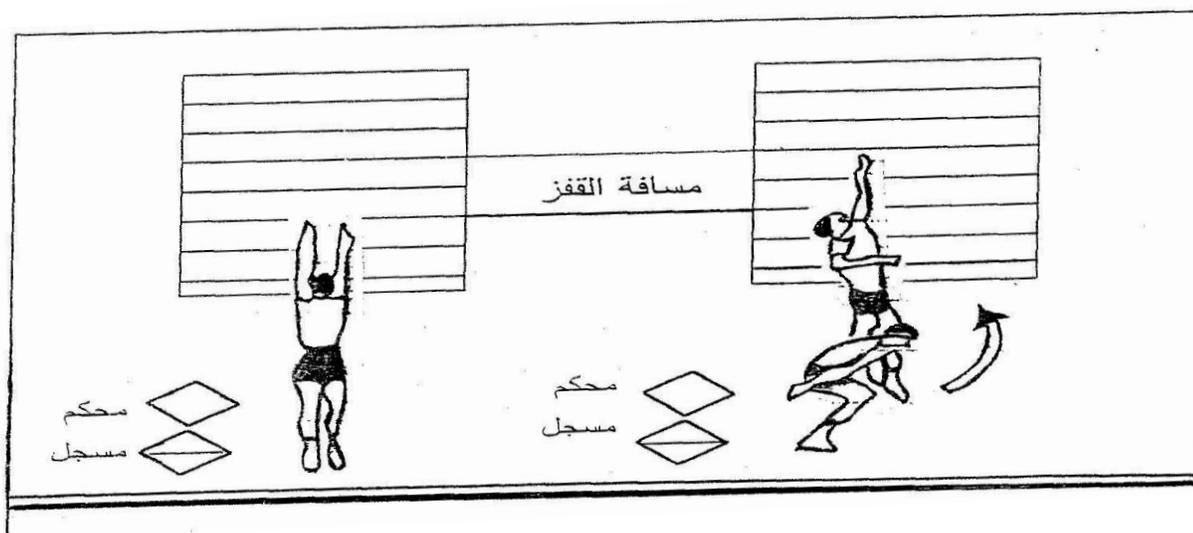
The laboratory weights the arms down and back with the torso bending downwards and flexing the knees to the position of the existing angle only.

The laboratory extends the knees and feet together to jump up with the arms weighted up and up to reach the maximum height possible, placing a chalk mark on the board at the highest point.

Calculation of scores: The degree of the laboratory, the number of centimeters between the line from which the position of the stand and the mark reached by the jump up.

Lead each lab (two attempts and take the best attempt)

Figure (1): The vertical jump test of stability(for Sargent)



### Main experience

Tribal Tests:

The experimental tests were carried out on Friday, 15/11/2018 at the National Center for Taekwondo National Center in Baghdad. All conditions related to the tests in terms of tools, time and place, as well as the method of implementation, The same in remote tests as possible.

:Curriculum

In order to achieve the objectives of the research, the researcher developed a series of special plauometric

exercises in the development of the explosive force of the leg muscles working on the ankle joint based on the scientific sources available and used by the experts in sports training using training tools and tools. 3) units per week for the pilot group within the main part of the special training unit, preventive unit time (15-20) minutes, weekly training days (Wednesday, Friday, Monday)

The exercise method was applied to the experimental research group, which includes the exercises of plauometric, weights and rubber bands with a density

of 50 - 70%, repetitions of (8-12), groups (3-4) and rest periods (30 th - 60 tha)

: Remote tests

After the completion of the preventive force exercises prepared, the tests were carried out on the individual sample of the search (12) player in the place and conditions of the same tests and procedures and under the direct supervision of the researcher.

:Statistical means

The researcher used the appropriate statistical means for research, the use of the statistical packet system (SPSS) and the percentage of development.

**RESULT AND DISCUSSION:**

To compare the results of the test, the researcher presents the results of the tribal and remote tests of the control and experimental groups in the vertical jump test of Sargent's stability and analysis, as shown in Table (1) and in Figure (2)

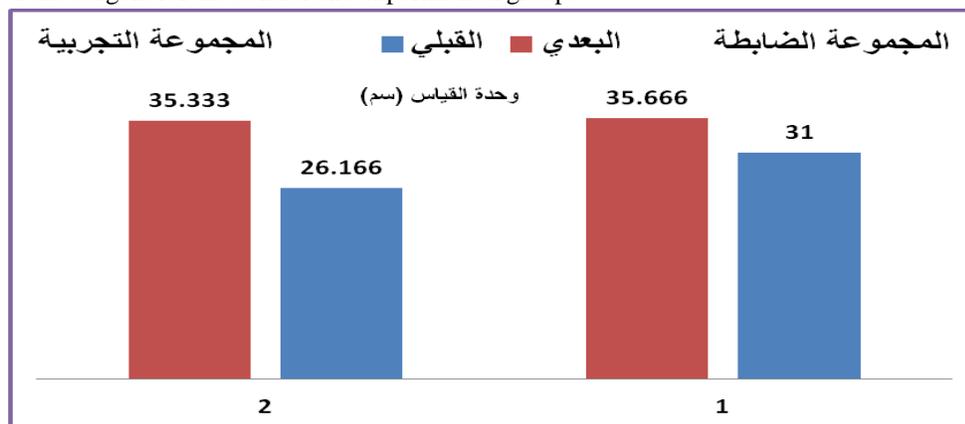
Table (1)

The results of computational arithmetic, standard deviations, calculated T values, and the evolution rate of the pre-and post-test tests of the control and experimental groups in the Vertical Jump Test of Sargent

Evolution%	Difference type	Moral real	T calculated	E	F	Post-test		Tribal Test		Variables
						P	S (cm)	P	S (cm)	
15.03%	moral	0.000	8.367	0.557	4.660	2.732	35.666	2.366	31.00	Control
35.05%	moral	0.000	16.893	0.542	9.166	3.983	35.333	3.970	26.166	Experimental

( 0.05) at the degree of freedom (5)

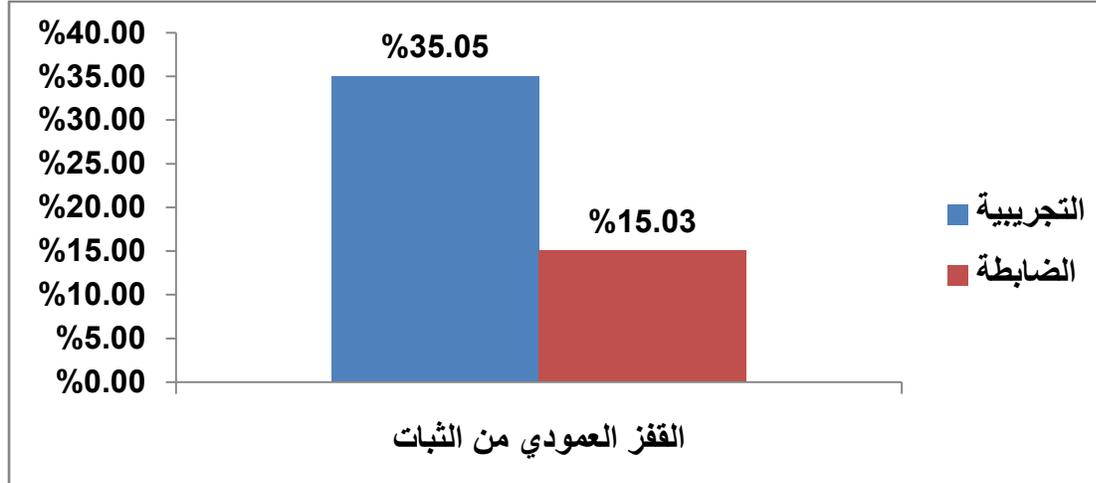
Figure (2): The differences between the computational circles between the tribal and remote tests of the vertical jump test of the Sargent for the control and experimental groups



Discussion of the results of the control and experimental groups to test the vertical jump of the Sargent in the pre-and post-test:

The differences between the experimental and control groups between the experimental and control groups in the vertical jump test of Sargent were shown in table (8). Figure (19) shows the differences between the two groups, (35.05%), while the control was a development rate (15.03%), as shown in Figure (3).

Figure (3) The evolution ratios for the vertical jump test indicate the stability of the control and experimental groups



The researcher points out that the evolution of the sergent jump test was the result of the evolution of the two men's muscles, which gave the force to use this force to jump up. This is evidence that the preventive exercises were built on scientific grounds so that the player can use the maximum Strength in the shortest possible time. These results are due to improvement in muscular nervous function, improved elasticity of articular ligaments, musculoskeletal strength and increased muscle capacity to produce strength as a result of the exercises focused on training of the experimental group. Tendons and flexions on the joints related to these movements so that this can affect the reduction of the time of central contraction and centralization with maximum strength to ensure an increase in the strength of muscle contraction. This is what Risan Khreibt and Ali Turki (2002) point out. "Strength resulting from muscle contraction is related to the kinetic units involved in this contraction and under the influence of force training. The ability of the nervous system to recruit more kinetic units to participate is increased. Muscle contraction, thereby increasing muscular strength."

The use of the various plometric exercises used by the researcher was important in the development of explosive force, which led to the timing and compatibility in the system of muscle contraction well

to achieve effective in the contraction of muscle contraction to perform the motor duty, which gives the possibility of applying the explosive force of the muscles and tendons and ligaments working on the limbs Which is responsible for the bending and torsion processes of the ankle and leg of the foot through the speed of delivery of the stimulus. This is confirmed by Hussein Al-Ali and Amer Fakhir Shagati, 2006, that "explosive force exercises work to stimulate different nervous system Are supported by the ability of muscle aggregates to respond faster and more forcefully to a slight and rapid change in muscle length.()

In addition to the significant differences in the vertical jump test from Sargent, it was found that the experimental group had reached 35.05% and the control group reached 15.03%. As shown in Figure 21, (Talha Hossam El-Din, 1997). "There are many studies that confirm that the adjustment of the plasma training in addition to traditional power training will lead to High power level."

These exercises were carried out under the supervision of the researcher and a team specialized in sports training to provide safety for the athletes during the exercise. This is what Hussain Al-Ali and Amer Fakhir Shagati, 2006, said: "Ballometric exercises are safe when carried out under the supervision of a training specialist. The idea of a well-supervised ballistic event

is to prevent injuries instead of causing injury. "This indicates that the exercise has benefited from the broad purpose of achieving the research objectives. Several studies of muscle strength have confirmed that "the development of the characteristic of force is accompanied by several important physiological aspects, including neurological capacity and increasing the rate of this ability as well as the control, timing and synchronization of the contraction of these units as well as increased susceptibility to nerve stimulation of muscle cells" Preventive exercise resulting from functional changes in the main working muscles led to increased muscle strength, which increased the explosive force and achieved better results in the experimental test of the experimental group.

**REFERENCES:**

- Jamal Mohammed Abdul Karim; Design of a proposed device for measuring and developing the motor response

time and its effect on the performance level of some basic skills in the Taekwondo game: Master Thesis (unpublished), Faculty of Physical Education, University of Baghdad, 2003.

- Ali Salloum Jawad; tests, measurement and statistics in the field of sports: (University of Qadisiyah, Dar Al-Taif, 2004).

- Talha Hussain Hossam El Din; Biomechanics Theoretical Basis and Practice, i 1 (Cairo, Dar Al-Fikr Al-Arabi, 1993).

- Risan Khreibat Majeed, Ali Turki Musleh; Theories of Force Training, I 1 (Baghdad, 2002).

- Hussein Al-Ali and Amer Fakhir Shagati; Al-Pliomtrak (Explosive Force Training), I 1: Baghdad, Al-Karrar Office, 2006)

- Talha Hossam El-Din et al; Scientific Encyclopedia in Training, I 1: (Cairo, The Book Center for Publishing, 1997).