

## **Effect of the opposite hierarchical training method to developing explosive power, which is characterized by speed and some functional variables for basketball players**

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### **Abstract**

The current world seeks to supply the most of the fruits of human knowledge and tries hard to search for the most important scientific facts, programs, means and advanced devices in various fields, including the sports field, and among these means is the use of various and advanced training devices and programs for the purpose of achieving the desired goal, which is to reach the desired level, the basketball game is one of the sports that need high technology in training according to scientifically studied principles because it is one of the games that relate to the abundance of its variables, composition and speed of change, all of which require a technical and high training depth and the players' possession of different physical characteristics mixed in physical and skill performance. The study aims to :

- Preparing suggested exercises in the opposite hierarchical training method.
- Identify the effect of the opposite hierarchical training course to develop explosive power, characterized by speed, and some functional variables for basketball players.

The researchers used the experimental approach with equal control and experimental groups with a cardiac and post-test, the sample of the research was the basketball youth, who numbered 12, and prepared exercises were applied using the hierarchical opposite training, as the curriculum lasted for (8) weeks and at (3) training units per week. The data were processed statistically and the researchers concluded the following. It was found that the use of the opposite hierarchical training method effectively contributed to the development of explosive power, characterized by speed, and some functional variables for basketball players.

### **Introduction:**

Those concerned with the sports aspect have a great role in the progress and prosperity of society through the advancement of sports and the achievement of high achievements in addition to searching and investigating the best means and methods that shorten the time and effort to achieve these achievements, whether in encouraging society to practice sport or the correct selection of athletes champions or the use of sports training according to the correct scientific

foundations and for all individual and differential games.

The basketball game is one of the sports that need high technology in training according to scientific and studied foundations because it is one of the games that relate to the abundance of its variables, composition and speed of change, all of which require a technical and high training depth and the players' possession of different physical characteristics mixed in physical and skill performance, this study focuses on knowing the functional adaptations of the body systems that occur to basketball players through special tests conducted by researchers in this field and the resultant real indicators that express the extent of improvement reached by the players, especially since the skill and physical performance is associated with its implementation with the level of interconnectedness between physiological variables and adaptation in performance, and this means that the basis on which the player builds in carrying out the tasks assigned to him during the competition period, so that coaches can develop and improve these capabilities through the levels that have been identified from the stage of competitions. Hence the importance of research in identifying the effect of the opposing hierarchical training method for developing explosive force, which is characterized by speed and some functional variables for basketball players.

### **Research problem :**

Resorting to the fields of scientific research after the great development in the game of basketball is one of the priorities of those in charge of this game. The research necessitated finding successful ways to pursue the great development that took place in sports in general and in the game of basketball in particular. The research problem was evident and included the importance of basic goals to reach basketball players to a high level, especially in preparing players, which is to prepare them physically and skillfully to ensure the development of the effectiveness of their performance during matches, thus achieving victory, and through the many observations and comparisons with the high levels reached by the players in various countries of the world, in the Arab world, regionally and internationally, the two researchers noted that there are big differences in preparing Iraqi players in the aforementioned aspects. Players have a variation in the level of functional variables and their impact on skillful and physical performance, which is what coaches need to know in the training process in how to evaluate players functionally and physically and in order for them to increase, stabilize or reduce the load, it also enables the detection of any abnormal imbalance in the health of the player at the beginning, and because the researchers are in contact with access to sports competitions, they noticed a weakness in the level of the players. Here the research problem lies in answering the question (Is there an effect of the opposite hierarchical training method for developing explosive force and characterized by speed and some functional variables for basketball players)

### **Research objective:**

- Preparing a training curriculum in the opposite hierarchical training method.
- Identify the effect of the opposing hierarchical training method for developing explosive force characterized by speed and some functional variables for basketball players

**Research hypotheses:**

- There are statistically significant differences between the pre and post-tests of the control and experimental research groups in explosive force and the characteristic of speed and some functional variables for basketball players
- There are statistically significant differences between the dimensional tests of the two research groups (control and experimental) in explosive strength and characteristic of speed and some functional variables for basketball players

**Research fields:**

**The human field:** Al-Karkh Sports Club youth basketball players.

**Time field:** from 2/1/2020 to 3/3/2020.

**Spatial field:** The closed hall for Al-Karkh Sports Club.

**Research methodology and field procedures:****Research Methodology:**

The experimental approach was used for its suitability to the nature of the problem, as it is the best approach that can be followed to reach real and honest results.

**Community and sample research:**

The research sample was chosen by the deliberate method from the youth players of Al-Karkh Sports Club in basketball and their number is (12) players. Homogeneity was also performed in (height, weight, age), and it was found that the members of the research sample are homogeneous, as the value of the torsion coefficient  $\pm 3$ , which is shown in Table (1), as well as the equivalence of the two research groups in the pre-tests, as shown in Table (2).

Table (1) shows the mean, standard deviation and the value of the torsion coefficient of the research sample for the purpose of homogeneity:

Variables	Mean	Std. Deviations	Median	Skew ness
Age	17.33	0.49	17.00	1.020
Length	173.58	5.93	172	0.799
Weight	56.92	3.60	56.50	0.35

Table (2) shows the statistical parameters of the research variables for purpose of equivalence.

Test	Control		Experimental		T value	Sig type
	Mean	Std. Deviations	Mean	Std. Deviations		
Legs explosive strength test	38.97	2.8	39.17	4.96	0.215	Non sig
Arm explosive force test	7.61	1.08	7.04	1.04	0.763	Non sig
The test of the characteristic strength speed of legs	8.33	1.86	8.30	1.26	0.323	Non sig
The arm-velocity characteristic strength test	7.5	0.55	7.67	0.52	0.542	Non sig
Resting pulse rate	73.95	0.621	72.51	0.528	0.701	Non sig

Systolic blood pressure	116.935	0.548	115.11	0648	0.561	Non sig
Diastolic blood pressure	76.40	0.648	76.101	0.691	0.902	Non sig
Vital capacitance	4361.30	60.599	4212.3	61.472	0459	Non sig

**Devices, tools and methods used in the research:****Methods of data collection:**

- Arab and foreign sources and fields
- Tests and measurement
- A device for measuring weight and height.
- Data registration and emptying form

**The tests used in the study:**

- Test of explosive strength of the muscles of the two legs <sup>(1)</sup>.
- The explosive strength test of the muscles of the arms <sup>(2)</sup>.
- The test of the strength characteristic of the velocity of the leg muscles <sup>(3)</sup>.
- The force test of the characteristic velocity of the two arm muscles <sup>(4)</sup>.

**Exploratory experience.**

The exploratory experiment was conducted on 01/2/2020 on a sample consisting of 2 players from the research community and not individuals from the research sample. The purpose of the exploratory experiment was to determine the repetitions and groups and the extent of how resistance exercises were conducted for the individuals of the research sample and the appropriate place to apply the curriculum as well as "to know the errors." Resulting from it and then conducting the tests used.

**Pre-test:**

The pre-tests were conducted on 8/1/2020 on the research sample.

**Experimental Approach:**

The researchers prepared a training curriculum based on the exploratory experience based on preparing the curriculum on some scientific sources and references. The two researchers took into account the level, physical ability and skill of the research sample. 2015 until 30/4/2015, and the implementation of the training unit took (80) minutes, as the ripples of the training load were 3/1. The curriculum was implemented during the special preparation period and applied to the experimental group, while the control group was training on the traditional curriculum.

**Post-test:**

The post-tests were conducted on 3/3/2020, and the researchers were keen to provide all the same conditions as the pre-tests and the same previously used tests.

**Statistical means:**

- Mean.
- Std. Deviations
- Median.
- Skew ness.
- T-test of two related means.
- T-test of two unrelated accounts averages.

**Presenting, analyzing and discussing the results:**

### Presenting, analyzing and discussing the results of the two experimental groups in the post tests of the research group:

Table (3) shows the arithmetic means, standard deviations, and the value of (t) computed in the post- tests of the experimental group.

Test	Pre-test		Post-test		T value	Sig type
	Mean	Std. Deviations	Mean	Std. Deviations		
Legs explosive strength test	39.17	4.96	42.12	4.03	3.362	sig
Arm explosive force test	7.04	1.04	9.33	0.89	4.332	sig
The test of the characteristic strength speed of legs	8.30	1.26	11.65	1.05	5.371	sig
The arm-velocity characteristic strength test	7.67	0.52	9.58	0.84	3.113	sig
Resting pulse rate	72.51	0.528	69.150	1.387	5.625	sig
Systolic blood pressure	115.11	0648	119.800	3.261	3.142	sig
Diastolic blood pressure	76.101	0.691	77.65	2.541	3.854	sig
Vital capacitance	4212.3	61.472	4664.68	261.765	4.512	sig

The tabular t value is below the significance level of 0.05 and the degree of freedom 4 = 2.78

In order to identify the extent of development in the physical variables (explosive force and the characteristic force of velocity of the muscles of the arms and legs) and the functional variables, the results of the pre and post tests were presented in table (3), which shows the values of the mean, the standard deviations, and the value of (T) calculated. The results showed that there are Significant differences between the pre and post tests and in favor of the post test, the researchers attribute the development of the experimental group to the use of opposite hierarchical training, which included physical exercises with weights, in contrast to the training load, which ranges from high to maximum, and the type and nature of the used and regulated weights that fit the load placed on the players' muscles and whose warm-up was appropriate for that training method, the various resistance exercises also contributed to the development of the explosive force and the characteristic speed of the muscles of the arms and legs through the appropriate stretching and contracting processes that do not cause damage to the articular ligaments, as the intensity of the training load was appropriate for the sample's age and their level of training to avoid sports injuries (MATHEWS.1997) <sup>(5)</sup>. The muscular strength of the arm and shoulder can be developed using weight training exercises with rapid performance of the arm, either the muscular capacity of the two legs is more important through jumping exercises and the like, as the players, during the performance of various motor skills, need rapid and repeated muscle contractions that serve the specialized activity, so there is a link strength with speed, and this in turn leads to the development of skillful performance, as the player reaches the stage of complete mastery of this skill by raising the physical aspects. This confirms that the training loads that were carried out according to the hierarchical methods set forth by the research were effective in developing according to the

components of the training load that was linked to the organizational template of the experimental groups.

(13:2016.p.206 ) the force characterized by speed, pulse rate, systolic blood pressure and the vital capacity) and the researcher ascribed these significant differences to two types of training units set in the main part of the training unit used for the experimental group and the method of the used training and the process of manipulation of time and gradation in intensity of the training units leads to remarkable development and the researcher ascribed.

### **Presenting, analyzing and discussing the results of the pre and post-tests of the control group regarding the research variables:**

Table (4) shows the values of the arithmetic mean, standard deviations, and the calculated and tabular (t) value of the control group for the search variables:

Test	Pre-test		Post-test		T value	Sig type
	Mean	Std. Deviations	Mean	Std. Deviations		
Legs explosive strength test	38.97	2.8	40.11	4.04	3.212	sig
Arm explosive force test	7.61	1.08	8.4	1.03	4.93	sig
The test of the characteristic strength speed of legs	8.33	1.86	9.67	1.03	4.561	sig
The arm-velocity characteristic strength test	7.5	0.55	8.11	0.89	5.432	sig
Resting pulse rate	73.95	0.621	71.125	2.214	3.981	sig
Systolic blood pressure	116.935	0.548	115.98	3.541	2.141	Non sig
Diastolic blood pressure	76.40	0.648	76.150	3.873	2.412	Non sig
Vital capacitance	4361.30	60.599	4331.6	254.131	4.536	sig

The tabular t value is below the significance level of 0.05 and the degree of freedom 4 = 2.78

It is evident from Table (4), which shows the values of arithmetic mean and standard deviations, as it shows that there is an evolution in the research variables for the control group, as the researcher prefers not to achieve a high development in the research variables until the approach used by the trainer does not depend on the hierarchical training method as well as not. Legalization of the components of pregnancy according to the variables that are appropriate to the research sample, so that the control group had less development than the experimental group.

### **Presenting, analyzing and discussing the results of the experimental and control groups in the post-tests:**

Table (5) shows the means, standard deviations, and the value of (t) calculated in the post- tests and for the two research groups.

Test	Pre-test		Post-test		T value	Sig type
	Mean	Std. Deviations	Mean	Std. Deviations		

Legs explosive strength test	40.11	4.04	42.12	4.03	3.362	sig
Arm explosive force test	8.4	1.03	9.33	0.89	4.332	sig
The test of the characteristic strength speed of legs	9.67	1.03	11.65	1.05	5.371	sig
The arm-velocity characteristic strength test	8.11	0.89	9.58	0.84	3.113	sig
Resting pulse rate	71.125	2.214	69.150	1.387	5.112	sig
Systolic blood pressure	115.98	3.541	119.800	3.261	3.782	sig
Diastolic blood pressure	76.150	3.873	77.65	2.541	3.651	sig
Vital capacitance	4331.6	254.131	4664.68	261.765	4.521	sig

The tabular t value is below the significance level of 0.05 and the degree of freedom  $8 = 2.31$ .

Table (5), which shows the presentation of the arithmetic mean and the standard deviations of the two research groups, shows that there is an evolution in both groups, but the development of the experimental group is a clear and better development than the control group and this is due to the use of the experimental method, which is the opposite hierarchical training method, which included exercises with weights as all the exercises they were similar to the movements performed by the players, which developed the same muscle groups working in performance during play, this is due to the use of this method leading to development as well as the use of the method of high intensity interval training applied to the experimental group, as the standardized training according to the scientific foundations, the graduation and the change in degrees of intensity according to the method followed below to increase the muscle tension as a result of the use of the training loads below the extremity to the closest ones It led to the excitement of the largest number of muscle fibers and then increased the strength produced ((the more involved the greater number of fibers, the more it led to the increase in muscle strength that the muscle can accomplish) (Allawi and Abdel Fattah 1997) <sup>(7)</sup>. The explanation for this is that the training loads and the progression in them in the training units from high to extreme intensity caused in the player's body responses in the muscle tissue to counter this change in training conditions, and after the development of the internal body reactions occurred, the players responded to this training and the repetition of work. He states (Bereka` 2005) <sup>(8)</sup>. The hierarchical methods are the most common methods of developing strength and ability, and the most important characteristic of this method is the gradual progression from low weights to high weights with few repetitions after that the player may return to lower weights and with higher repetitions and that the rapid appearance of muscle strength that favors both strength and speed in Movement (FRANDGO.1998) <sup>(9)</sup>, confirms that scientific training standardized in physical abilities leads to changes in most muscle components that develop kinetic energy and then skills related to performance.

### Conclusions and recommendations:

#### Conclusions:

- The results of the statistical evaluation in the application of the opposite hierarchical

method showed a positive development in favor of the research sample.

- The hierarchical opposite training method helped to develop the explosive power of the muscles of the arms and legs in the research eye.
- The opposite hierarchical style has a positive effect on developing the characteristic strength of speed in the arms and legs.
- The opposite hierarchical training method helped to develop some job variables for the research sample

### **Recommendations:**

- Adopting the training curriculum, the opposing hierarchical training method when developing some physical abilities and skills of youth players in the special preparation stage.
- It is necessary to take into account the scientific foundations and methods in planning training when using the hierarchical opposing training method and the definition of trainers and their assistants by its nature.
- It is important when training in the hierarchical opposing training method that the training tools be commensurate with the type of specialized sport.

### **References:**

- Bastwissi Ahmed: (1999); The foundations and theories of sports training; 2nd Edition: (Cairo, Arab Thought House.
- Albert Voor Castle: (1993); (Translation of the Training and Programming Center), Edition 1: (Beirut, Arab Science House.
- Muhammad Othman: (1990); Encyclopedia of Athletics - Technique - Training - Learning - Refereeing: (Dar Al-Qalam Publishing and Distribution,
- Muhammad Hassan Allawi and Abu Al-Ela Ahmed Abdel-Fattah: (1997); Physiology of Sports Training, Helwan University, Arab Thought House.
- Muhammad Subhi Hassanein and Hamdi Abdel Moneim: (1997); The Scientific Foundations of Volleyball and Methods of Measurement, 2nd Edition, Cairo, Al-Kitab Center for Publishing.
- Muhammad Subhi Hassanein: (1995); Measurement and Evaluation in Physical Education, 1st Edition, Part 1, (Cairo, Dar Al Fikr Al Arabi) .
- Muhammad Hassan Allawi and Muhammad Nasr Al-Din Radwan: (1999); Kinetic Performance Tests, 1st floor, Cairo, Arab Thought House.
- Muhammad Jaber Berekaa: (2005);The Integrated System for Strength Training and Muscular Endurance, Al-Maarif Foundation, Alexandria.
- Bomba ,T.O periodization : (1999); Theory and methodology of training ,human kinetics publishing company.
- FOX.E-L.MATHEWS.D.K: (1997); InterveltraningC.onditioning of sport and ceneral Fitness W.e saunder .
- DESPINAL d.FRANGGO: MDABOLIC RESPONSES.to prolonged work durng treadmill and wake Immersion running . FACULTY OF HEALTH LONDON . 1998 , P. 78



- Komi P.V: (2005);Strength and power in sport, The Olympic Book of sport medicine, Blackwell scientific publication Germany.
- Dr.Suhad Qasim AlMosawi Dr. Huda Shihab . Using falling (deep) Jump training units to improve the explosive and characterized by speed forces for the badminton players  
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