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A COMPARATIVE STUDY OF THE CHARACTERISTICS OF THE MAXIMUM STRENGTH OF THE ARMS AND LEGS BETWEEN WEIGHTLIFTING AND BODYBUILDING

Assistant Lect. Younis Sabih Abdullah
General Directorate of Maysan Education
Gmail: alkhzlyywns891@gmail.com

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Abstract:
One of the sports games and activities that those working in the sports field seek to raise their level more than it is, the sport of weightlifting and bodybuilding, there are many problems and obstacles that prevented its development and advancement due to the absence of scientific planning. Therefore, the researcher aims to study the characteristics of the maximum strength of the arms and legs among weightlifting players. Body building and its relationship to physical performance.
As those working in the sports field seek to raise its level more than it already is, the sport of weightlifting and bodybuilding is one of the games that depends on training physical attributes to a large extent, the most important of which is the attribute of strength because it has a direct impact on the level of achievement, as the game of weightlifting and bodybuilding suffered from many problems of the obstacles and problems in previous years that hindered its development while for the research hypotheses, they indicated the existence of significant differences in the quality of strength between weightlifting and bodybuilding athletes. The researcher used the descriptive approach using the survey method to suit the nature of the problem. As for the conclusions and recommendations, the researcher recommended the need for players and coaches to pay attention. By developing strength qualities through acquiring information.

Keywords: Muscular Strength, Weightlifters, Body Building, Sports, Athletes.

Introduction to research

1-1 Introduction and importance of research:

Our current world is witnessing comprehensive scientific development in various different fields of life, each of which serves the development of man and brings him to the best achievements in various fields. One of these fields is the sports field, which is almost comprehensive with applied information in a real pursuit of raising the level of high standards and many sports activities and one of the important games and activities that those working in the sports field seek to raise their level more than it already is the sport of weight lifting and body building is one of the games that relies on training physical attributes to a large extent, the most important of which is the attribute of strength because it has a direct impact on the level of achievement, as without it players cannot perform artistically. It is true for effectiveness. Therefore, the absence of this characteristic prevents the lifter from overcoming the weight and achieving his goal by lifting it as best as he can achieve it, also, with regard to body building, he relies heavily on this characteristic to show the features of this muscular system and its wonderful typical shape as best as possible. Accordingly, the researcher decided to study the importance of this important characteristic for identifying the extent of the level of the player's maximum leg strength is his qualification for performing the event to search for what can be built to obtain the best results that help those working in this field to develop.

2-1 Research problem:

The game of weightlifting and bodybuilding suffers from many obstacles and problems that hinder its development and improvement due to the absence of scientific planning and the adoption of modern scientific methods in methods of strength training, as strength is one of the most important sources of the physical elements that the weightlifter and bodybuilder rely on, which contribute to the required effective performance, and among them are the best of the best this can be the result of gaining the strength required to overcome a certain weight through high physical and skill effort to achieve achievement, in addition to improving muscle strength for a period of time to show the features of the muscular system in all parts of the body, as in body building. Accordingly, preparing and gaining strength has become an important necessity to get rid of the difficulties facing players during the tournament.

3-1 Research objectives
1- Identify the characteristics of the maximum strength of the legs and arms among weightlifters and bodybuilders.
2- Identify differences in the maximum strength of the legs and arms between weightlifting and bodybuilding athletes.

4-1 Research hypotheses:
There are significant differences in maximum strength between weightlifting and bodybuilding athletes.

5-1 Areas of research:
1-5-1 Human field Maysan Club players for weightlifting and bodybuilding.
2-5-1 The spatial area: Maysan Club Hall for weightlifting and bodybuilding.
3-5-1 The time frame for the period from 25/11/2022 to 30/3/2023

2- Theoretical studies
2-1-1 Muscular strength
Maximum muscle strength is usually defined as the largest amount of weight that can be lifted in one repetition, or it is the largest resistance that can be overcome during a single muscle contraction. We can also define it as the largest value of muscle force produced through maximum voluntary contractions, and it plays an important role in sporting events that require... Overcoming or controlling high resistance, such as throwing a weight or a hammer, is also very important in sports games such as wrestling, boxing, racquetball, and ball games. Maximum muscle strength is an essential characteristic in developing explosive ability at different speeds, from lifting weights to starting a race with a hundred meters of swimming.

2-1-2 Benefits of muscular strength
Training to develop muscular strength receives wide attention from coaches and athletes in various sports and events because of its benefits in athletic achievement, and among these benefits.
1- Training to develop maximum muscular strength. It is the only form of muscular strength that refers to slow motor units and fast contracting motor units at the same time and helps to generate very high force.
2- Training to develop maximum muscle strength improves harmony between the working and opposing muscles in the movement joint, which contributes to the smoothness and economy of movement.
3- The level of maximum muscle strength that this training develops is equivalent to three times what can be increased in muscle size by muscle hypertrophy, because the unnecessary increase in muscle size may negatively affect performance in many different types of sports. Why do we need maximum muscle strength? The performance of skills in sports or the requirements for achievement are based on ability, strength and speed. The ability requirements cooperate, but their level is the minimum that the athlete needs in athletics, football games, and throwing, jumping, and wrestling events(1) .

2-1-3 Types of muscular strength
Although the definitions of muscular strength have focused on it being the maximum muscular contraction that can be performed once, the quality of this muscular contraction is static or the maximum movable muscular contraction, with different forms of the latter type,and as we mentioned previously, from an applied standpoint, we can isolate the components of muscular strength from the two components of speed and endurance. Therefore, when training to develop muscular strength, the type of strength to be developed must be taken into account, as three types of strength can be identified, and it is advised as follows:
1- Maximum forces: It means the ability of the nervous and muscular system to produce the maximum voluntary contraction. It also means the ability of the muscle to overcome or confront external resistance, this means that constant maximum forces appear and this type of force appears when contracting in a certain position of the body against the influence of Earth's gravity, such as It occurs in some gymnastics and wrestling movements when the maximum forces can overcome the resistance they face. In that case, it is called the maximum moving force, and this is what is called in weightlifting.
2- Strength characterized by speed: It means the ability of the nervous and muscular system to produce rapid force, which requires a degree of compatibility in merging the force and speed characteristics into one component. The force characterized by speed is related to activities that require strong and fast movements at the same time, such as jumping and throwing of different types and games. Sprint and ball kicking skills.
3- Endurance of strength: This means the ability of the nervous system to overcome resistance for the longest possible period in the face of fatigue. This period usually ranges between 6 seconds to 8 minutes. This type of sports appears in rowing, swimming, and running, as the force of pushing or pulling leads to an increase in the distance traveled. As a result of an increase in speed, with a high degree of performance endurance during that specific time period(2) .

2-1-4 The importance of muscular strength
The importance of muscular strength for athletes is due to its close connection with some of the complex components of physical fitness, such as the ability required by the nature of performance in the activities of jumping, throwing, hitting the ball, and diving in swimming, if these activities require the production of rapid force, that is, the result of

force in speed. Muscular strength is also linked to the speed component, especially systolic speed in Running and swimming, as increasing the push of the foot to the ground increases the length of the running stride, and the pulling force in swimming leads to an increase in the swimmer's body moving forward. Both factors, increasing the pushing and pulling force, lead to the speed of covering the distance in the shortest possible time for muscle strength, a significant increase in the endurance component, and it gives when performing Physical activities that require continuous performance of strong muscle work, such as wrestling, boxing, etc. Muscle strength is linked to the general health of the individual, as it works to develop the muscular tone of the body. The strength of the back muscles works to protect the individual from exposure to a herniated disc, and the strength of the abdominal muscles helps to resist pressure from the internal viscera. It also prevents the appearance of the stomach or exposure to lower back pain, and the person enjoys a good degree of muscular strength. It contributes to protecting him from exposure to injury, and gives the body good shape. Muscular strength has a clear impact on the psychological aspect of the individual, as it absorbs a good degree of jumping and leaping, gives him a kind of emotional balance, and supports He has the elements of courage and boldness. Muscular strength is one of the necessary qualities that must be developed appropriately when using resistance. The reason for its importance is due to the following:

1- Being one of the basic requirements for developing explosive power and speed.

2- A well-built muscular structure acts as a shield that helps withstand shocks resulting from the body colliding with other objects.

3- Muscular strength contributes to maintaining a person's health and protecting him from some injuries that appear after the age of forty(3) .

2-1-5 Factors affecting muscular strength

1- Type of muscle fibers: The human body contains red and white fibers. The red fibers produce slow contractions for a long period, while the white fibers have the ability to produce fast contractions for short periods, and the white fibers are what is required for speed.

2- The physiological section of the muscle or joint muscles: the individual's nervous pattern. Neuromuscular coordination. This relates to the extent of the processes of desistance and arousal, which is the extent of coordination in the nerve signals that reach the working muscle groups to order each other to stop moving.

3- The ability to relax muscles: Muscle tension in the corresponding muscles is one of the factors that hinder the speed of motor performance. Muscle tension is often due to the athlete's lack of mastery of the correct method of performance or to a high degree of arousal and emotional tension.

4- The ability of a muscle to be stretched: A stretchable muscle can give a strong, rapid contraction, unlike muscles that are not stretchable. The importance of stretching is not limited to the muscle involved in movement only, but its importance is also greater for the corresponding muscles so that movement is accomplished easily.

5- Willpower: Willpower is an important factor in developing the level of strength and speed of an individual athlete by overcoming internal and external resistances to carry out an activity that moves towards reaching the goal he seeks.

6- Angle of muscle tension: Speed is related to the mechanical foundations of movement, which are represented by the position of the center of gravity of the body and the line of action of the force, the angles of launch and the length of the movement path.

7- Flexibility: If the movement of the joints is flexible in working with a wide range during movement, including the movement of fast running, then it is possible to obtain the longest step that is more suitable for running and thus improving movement.

8- Reaction: Reaction time is one of the factors that affect the running completion time, and it means estimating the individual's response to the stimulus(4) .

2-1-6 Types of muscle contraction

1- Mobile (olivary) muscular contraction: The muscle shortens in length while increasing its tension when performing this type of muscular contraction. This contraction is used to continue types of muscular work, especially in the case of lifting weights.

2- Constant (isometric) muscle contraction: During this constant contraction, the muscle releases tension, but its length does not change. This type of muscle contraction occurs during the performance of sporting activities such as wrestling and taking fixed and mixed positions, as in gymnastics, or when trying to push a certain weight that cannot be strengthened. The individual has to move it or try to push the resistance of the wall. In this case, it becomes possible to produce a large muscle force without showing a clear movement of the working muscles or the weight that the individual is trying to lift or push. The result of muscle force through static contraction differs from moving muscle contraction.

3- Mixed muscle contraction:

This type of contraction represents a combination of fixed and dynamic contraction, that is, the occurrence and non-occurrence of a change in the length of the muscle or the position of the joint. Muscle strength can be developed using two methods, the first depends on developing strength by increasing muscle hypertrophy by increasing the cross-sectional area of the muscle fiber. As for the second method, strength is developed, through the nervous factor without increasing the size of the muscle mass. Therefore, the use of either method or the combination between them is determined based on several factors, including the type of specialization, the individual characteristics of the athlete,

and his level of ability. Hence, some activities require developing muscle strength while not increasing or even reducing body mass. Body mass, such as wrestling weights, light weight lifters, and boxing. In such a case, the second method is used to develop muscle strength through the nervous factor without increasing the size of the mass, while on the contrary in some other sporting activities, hammer swings and shot put(5).

3- Research methodology and field procedures

3-1 Research methodology:

The research method is a method that the researcher uses to study the problem in order to reach and discover it. It is also one of the means that helps the researcher to choose his hypotheses, and since the nature of the problem is what determines the method used in the research, so the research problem imposed the use of the descriptive method in the style of a survey study, as it is the best and easiest method in Achieving the research objectives. Survey studies use various scientific research tools to obtain the necessary information and data, such as the questionnaire, the interview, and its relationship to the test.

3-2 Research sample:

The objectives that the researcher sets for his research and the procedures that he uses will determine the sample that he will choose. Therefore, the research sample was chosen randomly and included Maysan Sports Club players for weightlifting and bodybuilding, who numbered (20). Where (5) players from bodybuilding and (5) players from Weightlifting for youth and weight (26).

3-3-1 Means of collecting information.

1- Sources and references.

2- Personal interviews.

3- Tests used.

3-3-2 Tools used:

1- Support braces.

2- shift

3- Iron tablets weighing (10) kg - (20) kg (6).

3-4 Tests used

3-4-1 Testing the maximum strength of the arms

- Description of the test: The athlete sits on a regular bench and lifts a weight of (20) kg, (30) kg, (40) kg, and (50) in a row, and the highest weight he lifts is called the front press.

3-4-2 Back physical test to measure the maximum strength of the leg muscles.

- The purpose of the test is to measure maximum forces.
- The necessary tools, bar support supports, iron discs, and a weight of (15) kg for each disc, as well as the use of a recorder.
- Description of the test: The athlete stands with the barbell on his shoulders, then bends completely downwards, with the torso vertical on the surface of the ground, then rises fully upwards once (7).

3-4-3 Maximum tensile test for males

- Purpose of the test: to measure the endurance and strength of the muscles of the arms and shoulder girdle.
- Tools: A horizontal pick with a circumference of (1.5) inches, made of wood or iron.
- Description of performance: The tester begins by pulling up his arms to raise his body up until his chin reaches the top of the pull-up bar, then he extends his entire arm in order to lower his body down, as in the initial position of the test.
- Calculating grades: Each correct pull is calculated by reaching half the test at the top of the horizontal bar, and its number is calculated accurately.
- The intensity is not calculated if the chin does not reach the top of the bar.
- The intensity is not calculated if the tester swings his legs, bends his knees, or leans his torso while performing the test.

3- 4-4 Test of pushing a medical ball weighing (3) kg with both hands

- Purpose of the test: to measure the muscular ability of the arms and shoulder girdle
- Tools: a supportive chair, a rope, a medicine ball weighing (3) kg - a measuring tape, markers or flags.
- Performance description

1- The laboratory sits on a chair with a colleague holding his back with a rope and holding the medicine ball in his hands

2- The ball is pushed with the hands forward and upward as far as it can go, and the tester gives three attempts and takes the result of the best one

- Score calculation: The best of the three attempts is calculated to measure the distance from the front edge of the chair to the farthest point the ball leaves on the ground.

3-5 The exploratory experiment

The exploratory experiment is an initial, small experimental study carried out by the researcher before he carries out his research. The aim of testing the research methods and tools is in order to obtain the necessary information to benefit from when conducting the main experiment for the purpose of following the sound scientific context in the research procedures that the researcher carried out in conducting the exploratory experiment. Maysan Sports Club Hall for weightlifting, numbering (5) weightlifters and (5) bodybuilders, on Tuesday 20/11/2022.

3-6 Main experiment

The researcher conducted the main experiment on weightlifting and bodybuilding players on 28/11/2022 and in the weightlifting hall of the Maysan Sports Club.

3-7 Statistical methods

The researcher transcribed the data and placed it in tables. It was studied and processed statistically in order to reach the final results, where the following statistical laws were used.

4-1 Presentation, analysis and discussion of the results

4-1-1 Presentation and discussion of the test results for the maximum strengths of the arms and legs for the research sample. Table No. (1) shows the calculations, the standard deviations, the calculated and tabulated T-values, and the type of significance of the test for the maximum strengths of the arms and legs.

Statistical significance	Tabular T value	Calculated T-value	Bodybuilding	Weightlifters			the sample
Moral	2,31	3,2	4 ±	– s	4 ±	– s	Maximum arm strength
			6,8	42	3,16	50	Maximum arm strength
Moral		8,6	4,74	94	3,16	115	

Table (1) shows us that the value of the arithmetic mean for the maximum strength characteristic in lifting weights reached (50) for the arms and (115) for the legs, with a standard deviation for the arms (3.16) and for the legs (3.16). As for the bodybuilders, the arithmetic mean reached For the arms (24) and for the legs (94), with a standard deviation for the arms (6.8) and for the legs (3.74). After processing the results statistically, it was found that the calculated (T) value is greater than its tabular value, which indicates that it is significant at the significance level (0.5).) and the degree of freedom (8), as the researcher believes that developing maximum strength is one of the requirements of weightlifting, as it is the first effective element that is based primarily on developing movement and work by raising the required intensity that is consistent with the athlete's ability, and thus leads to an increase in the muscle fiber section combined with a group of fibers. Muscle strength, which leads to an increase in maximum strength, which is directly proportional to the cross-section of the muscle, and this is what Wadih Yassin mentions. As for bodybuilding sports, the movement of which requires an increase in volume, which leads to an increase in the opening of new capillaries through increased repetitions, and therefore we see that maximum strength is a basic requirement. For lifters, while maximum strength for bodybuilding is a secondary requirement because there are no external loads that the athlete is trying to get rid of, this is why it agrees with what Muhammad Hassan Allawi pointed out(8) .

5- Conclusions and recommendations

5-1 Conclusions

1- There are statistically significant differences in the maximum strength of the arms in favor of weightlifters.

2- There are statistically significant differences in the maximum strength of the legs in favor of weightlifters.

5-2 Recommendations

1- Increasing training periods for the strength characteristics of any bodybuilding athlete and paying attention to them

2- The need for players and coaches to pay attention to developing all strength qualities by acquiring information and training lectures for them.

Footnotes:

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6 - Ali Shabout Ibrahim Al-Sudani, The effect of a proposed training curriculum on some mechanical variables in the snatch and jerk lifts for cubs aged (10-14) years, unpublished doctoral thesis, College of Physical Education, University of Baghdad, 2002, p. 65.

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