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Research Article

The effect of special exercises and assistant apparatus in muscular strength and some mechanical variables of upper limbs for bodybuilding's' players

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Abstract: Current research aimed to study the variances in muscle strengths in the body and to see the extent of its impact on the evolution of muscle strength and muscle size in terms of its circumference and depth. This research's sample included players from the province of Babylon in body building sports and numbered five players by one experimental group with tribal and dimensional test. Researchers used the experimental method by implementing several exercises and devices designed for the purpose of developing muscle strength and increasing the muscle balance of the upper limbs by reducing the differences on both sides of the body that lasted eight weeks by four training units during the week. Researchers concluded that the exercises used, and the device designed to have a positive effect in the development of muscle strength in the sample of research .

Keywords: Maximum strength ,Muscles balance **,** symmetrical muscles.

1. Introduction

Sports training is one of the most important practices that contributed effectively to the development of sports and its success by studying athlete's body extensively. It also helps in knowledge of the possibility of the athlete and work on the integration of the body structure. This works in terms of weaknesses that may affect the level of sports and strengthen the muscular system and games that depend effectively on sports training and the study of the body structure is the sport of body building and this confirmed (Beckmann & Elbe, 2015). Beckmann and Elbe (2015) mentioned "That each training group and any method must be prepared in a way that gives an effective impact in the development of all the capabilities of the type of activity." (p. 108). Balyi and Hamilton (2004) confirmed that these sports required the coach and the player to be more accurate in training when it comes to the physical structure of the athlete.

These training programs of strength leads to weight gain which is free of grease due to the enlargement of the muscles. Moreover, McMahon (2020) studied the most accurate details of athletes in terms of "anatomical differences on both sides of the Poison and its negative impact on the results of the players, especially if this leads to the loss of muscle coordination on both sides of the body and through the dependence of the athlete on the preferred or strongest side when practicing muscle strength exercises, which increases the muscle density of that muscle group at the expense of the other even if it is slightly" (p. 43). Keeping the muscles in a real balance with amplified strength and increasing the motor range of muscles and joints is the first requirement to develop susceptibility and balance. So, it is necessary to employ special devices that require the athlete to use the sides of his body in a close or equal form during exercise in order to develop muscle strength and increase its size while maintaining muscle coordination in the players.

Hence the importance of research in the preparation of special exercises using the muscle balance device to develop muscle strength and muscle balance and reduce the differences between them on both sides of the body, which is an attempt by researchers to contribute scientifically to support this important aspect.

2. Literature review

Kazem & Hussein (2020) observed that the effect of special exercises and electrical stimulation in the balance of strength and some functional and biomechanical variables and body measurements on both sides of the body and the achievement of the Iraqi youth team quartet of young people with disabilities. Similarly, Liokaftos (2017) mentioned that the effect of exercises using the strength building tools, the balance of symmetrical muscles and the progress of the nether lift for the young trainers.

3. Research questions

1. Does the exercises used in the device improve the balance and consistency of muscle strength on both sides of the body and the development of muscle strength?
2. Is it possible to reduce the differences on both sides in terms of size and muscle strength?

3. Is it possible to have a consistent shape on both sides of the body?

The researcher imposed

1. There is a positive effect of special exercises in the development of maximum strength, the development of muscle balance on both sides of the body and the reduction of differences in the size and strength of the target muscles.
2. There are positive effects in some kinematic variables.

4. Methodology

The researchers used the experimental method with one experimental group with the strength of (5) players with tribal and dimensional testing.

Variables

The researchers resorted to identifying a set of physical abilities for this study, namely the maximum strength of muscles (shoulders, arms, chest, and back) and the physical measurements of the circumference of the muscle of the humerus and forearm on both sides of the body. Moreover, measuring the depth of the chest muscle on both sides of the body is also important because it accurately expresses the size of these muscles of the athlete on both sides of the body right to the upper end of the upper end. It is crucial because the researchers relied on photographing and analyzing all tests' motor paths to extract the kinematic variables' variables, where the researchers deliberately studied the upper part of the body.

1. Cross section: The human body cuts from the middle and upper part and a lower part.

Through the above, the researcher will study the upper part of the vertical division, i.e., the sides of the upper body in terms of some physical variables, kinematic variables and physical measurements.

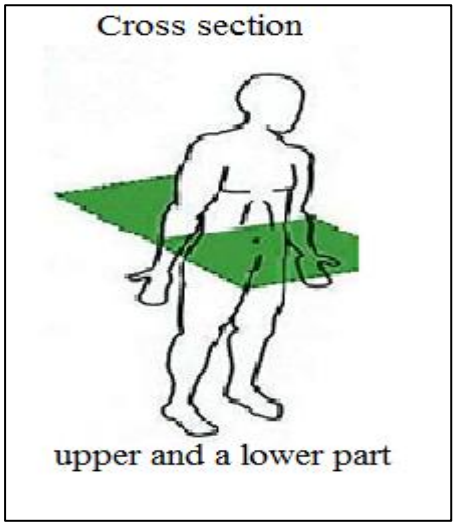

Figure 1: Cross sections of the body

The researcher designed a muscle balance training device for the muscle group (arms - shoulders - chest muscles - back muscles) through the conditions prepared by the device that contains an iron bar installed inside it (Polburn) works in a similar shape to the balance and at different heights allow the application of special exercises to develop the said muscles.

The purpose of the design of the device

1. The athlete is forced to force on both sides of the body equally to overcome resistance to reduce muscle balance on both sides of the body.
2. Develop muscle strength (maximum) for the muscles of the chest and the back shoulders and the arms.

Reduce differences on both sides of the body in terms of muscle strength and muscular shape.

Figure 2: Muscle Bars

The Physical Tests:

1. Bench Press.
2. Front pressing.
3. Iron weight.
4. Deadlift.

Physical measurements

Table 1: Physical Measurements

Physical Measurements		
Body parts	**Right**	**Left**
The circumference of the humerus		
Forearm circumference		
Deep chest		

Tribal tests:

The tribal tests were conducted on Thursday, 22 October 2020, in one of the halls of agility and body building (Colden Gym Hall) in Babil province according to the following division:

The sample members were collected in the experimental and control groups at 9 a.m. for the purpose of taking the physical measurements, which included the circumference of the humerus muscle, the circumference of the forearm muscle, the depth of the chest muscle, the weights of the players, and the preparation of the devices and supplies used in the conduct of physical tests. At 1p.m. on the same day, researchers began conducting physical tests on the research sample, which included a range of exercises (Bing Press Level, Bing Press Down, Forward Press, Rear Press, Kel iron standing, dead left) the results were confirmed as well as tests and measurements were documented.

The main experience

The researchers used the experimental method of the two groups (experimental and control) and proceeded to implement the vocabulary of the main experiment consisting of (exercises using the muscle balance training device) on Friday (23/10/2020) in one of the halls of building civil bodies in the province of Babylon, and consisted of conducting training units during the duration of the experiment for the period from (23/10/2020) until

(23/12/2020) Using exercises prepared by researchers, the work of the researchers in the main part of the training unit and the method of training of the low to high intensity through the muscle balance training device designed and tests prepared in advance and the exercise time of (45-60) minutes as well as the application of three training units per week and for two months equivalent to 24 training units. The control group was subjected to the same number of training units prepared by the trainers in the hall at three training units per week for eight weeks and then the after tests were conducted.

Exercises used in research (on device)

1) First exercise (a head in front of me)

It is one of the exercises used in body-building exercise which depends on body weight mainly as additional weights can be used to increase the degree of difficulty of exercise. It also has different modes and multiple grips. This exercise targets the muscles of the chest, back, shoulders and arms, depending on its position and grip. The coins are divided into: -

Regular Grip [(1)]

The back of the hand in the usual fist is directed towards the face. The shoulders are moved from the side towards the body. In the usual grip, the muscles of the tapers and the back are turned on. A regular fist exercise requires placing more hands than shoulder width to operate the back muscle. Moderate fist exercise is generally more difficult because there is no significant help from the biceps muscle in the ups and downs.

Crossed or inverted fist

The palm of the hand in the cross fist is directed to the face. The arms and elbows are moved from the front (full movement in front of the body). The muscles used in the cross fist are the inner head of the biceps muscle and the upper part of the chest muscle. Hands are positioned wide shoulder width. In cross-fist exercise, the average difficulty is considered to be more dependent on the biceps muscle and is much easier for beginners without having to strengthen the upper body in advance.

2) The second exercise is a parallel dive (perlit)

The exercise begins by relying (attachment) on the middle iron handles and the position of the arms to the side of the body and fully outstretched and the hand grip (palm of the hand) towards the body and the body is moderate and the shoulders are pushed forward to maintain the balance of the body and the freshness forward begins the athlete bends the arms and down to the extent that the humerus becomes parallel to the handle after

The upper arms are fully extended, and the exercise is repeated according to the curriculum (if the placement

The torso affects the muscular focus of the exercise. The slight tendency forward is better to target the pectoral muscles and the higher the degree of lean forward, the more the degree of operation of the pectoral muscles, and the position of the body's erection in a straight way, transfer the concentration of exercise to the trisspeds)[(2)]

3) Exercise III diving bras

The exercise begins from the position of the front seat holding the athlete with his hands on the lower bar and based on his feet on the ground and be the position of the body diagonally and the arms fully extended to the top and then the athlete begins to go down and climb and the athlete can perform the exercise with different grips and depending on the ability of the athlete to perform.

A range of exercises have also been applied to the device, including: -

1. Back-to-back brain exercise
2. Cross-brain exercise
3. Trapis Dive
4. Based in Front

Subsequent tests

The Subsequent tests were carried out on the sample of the research after the completion of the vocabulary of the training curriculum within the plan prepared before, on Wednesday (23/12/2020) and in the same mechanism used in the tribal test where the sample members were collected at (9) a.m. to take the physical measurements and at 1 p.m. in the supervision of the researchers and their keenness to create the same conditions as in the tribal tests.

5. Results

Table 2: Shows the difference of the computational circles and its standard deviation and the calculated value (t) and the indication of the differences between the results of the tribal and dimensional tests in the physical abilities of the experimental group.

Physical abilities	Unit of measurement	P	P.P	Value (t) Calculated	Error level	Indication of differences
Bench Press	KG	11	1.369	17.962	**0000.**	**Moral**
Front pressing	KG	10	1.767	12.649	**0000.**	**Moral**
Iron weight	KG	58.	1.369	13.880	**0.000**	**Moral**
Deadlift	KG	12	4.107	6.531	**0.003**	**Moral**

Table 3: Shows the difference of the computational circles and its standard deviation and the calculated value (t) and the indication of the differences between the results of the tribal and dimensional tests in the physical measurements of the experimental group.

Physical measurements	P	Value (t) Calculated	P.P	Error level	Unit of measurement	Indication of differences
Right Humerus Circumference	**5.5**	**24.596**	**0.5**	**0.000**	**CM**	**Moral**
The circumference of the left humerus	**5.3**	**7.772**	**1.524**	**0.001**	**CM**	**Moral**
The difference between the two muscles	**1.2**	**4**	**0.670**	**0.015**	**CM**	**Moral**
Deep right chest	**3.65**	**9.503**	**0.858**	**0.001**	**CM**	**Moral**
Deep lift chest	**0.004**	**6.038**	**1.555**	**4.2**	**CM**	**Moral**
The difference between the breasts	**0.005**	**5.477**	**0.306**	**0.75**	**CM**	**Moral**

6. Discussion

Through Table 2, we see the existence of significant differences between the tribal and dimensional tests in maximum strength and in favor of the dimensional test and the researcher attributes this development to exercises using the muscle balance device designed by the researcher, which is a modern type of exercises that includes the combination of strength training and muscle balance, which led to the creation of conditions difficult to perform in accordance with the effectiveness and effect in a way Positive on increased muscle strength and muscle balance on both sides of the body. The device used provides potentially effective exercises, and this is what Fletcher et al. (1996) stressed, "That each group of exercises and any means must be prepared in a way that gives an effective

effect in the development of all the capabilities of the type of activity." (p. 856). And on the muscles working on these tests, the researcher developed the chest muscles by practicing perlet (parallel dive) which effectively affects the lower chest muscles and this is confirmed by Nick Evans " the muscles involved in the exercise of diving on parallel are the lower part of the major pectoral muscle (max), trispies and front albinism" (p. 858) as well as the exercise of diving suspenders Which works to develop the chest muscles as it has been applied level and in a diving form and this is confirmed. To lift the body from the ground by the support of the hands on the terraces or suspenders the target muscles are the upper and external muscles of the chest" (p. 860). In addition, the device works to develop the muscles of the shoulders through exercise of the mind. Which has been applied with a variety of form.

Through Table 3, we see differences between tribal and dimensional tests of moral significance in the physical measurements in favor of the dimensional test and the researchers attribute these differences to the use of the muscle balance device designed to impose on the player the distribution of strength equally on both sides of the body to obtain a balanced position, which reflects on the shape of muscles and their coordination on both sides of the body.

The fact that the maximum strength of the chest muscles of the back of the arms and shoulders is confirmed by (Kraemer & Fleck, 2005) "The strength training programs lead to an increase gained in the weight free of grease due to muscle enlargement" (p. 16). The researcher has developed the maximum strength of the chest muscles by practicing per let (parallel dive) which effectively affects the lower chest muscles as well as the exercise of diving suspenders if applied evenly or in a diving form, in addition, the device works to develop the muscles of the arms and shoulders through exercise "The physiological factors affecting muscle strength are the physiological section of the muscle and means the sum of the section of each fiber, the more muscle strength," (p. 220).

Table 4: Shows the difference of the computational circles and its standard deviation and the calculated value(t)and the indication of the differences between the results of the tribal and dimensional tests in the kinematic variables of the experimental group.

Kinematic variables	Unit of measurement	Value (t) Calculated	P	P.P	Error level	Indication of differences
The difference between the arms in the bench-press		8.827	2.316	0.586	0.001	**Moral**
The difference between the arms in the front pressing		31.116	6.094	0.437	0.000	**Moral**
The difference between the arms in the iron weight		12.257	3.686	0.672	0.000	**Moral**
The difference between the arms in the deadlift		16.391	4.768	0.650	0.000	**Moral**

(*)Degree of Freedom(4=1-5)
(*)

Moral if the error level is lower than the indication level (0.05)

Through Table 4 we note the clear development in the variables of the kinematic research, which is the reduction of the differences between the arms in the level and lower the point, the front and rear press, the iron standing and the made of the point and attributes this development to the accurate diagnosis by imaging and analysis to perform and develop appropriate exercises and this is confirmed by (Knudson, 2013) where he mentioned that, "The dynamic analysis is interested in studying the skilled performance of the athlete and giving the correct analysis to Each part of the movement in a way that helps the trainer to diagnose mistakes and develop appropriate solutions" (p. 108). If the change in reducing the differences between the arms of the two sides is due to the exercises used on the device designed and the effective role of this exercise through the difficulty of performance on the device that makes the athlete make a great effort to reduce the balance and overcome the resistance represented by the weight of the body by isolating the muscles "Keeping the muscles in a real balance with increased strength and increasing the motor range of muscles and joints is the first requirement to develop the susceptibility and balance of their balance", as well as the training conditions provided by the device during exercises that enabled the players to overcome the imbalance that appears to them sometimes during the touch. The movement from the beginning of the exercise performance to the end, so the researcher focused on organizing the exercises in a way that fits the goal and this is what (Kraemer & Ratamess, 2004) stressed "The appropriate sequence of training is the one that produces superior results and not just the amount of work or the number of repetitions accomplished" (p. 681). The results achieved by the use of the research group (experimental group) of the designed muscle balance training device and the statement of their effect in the development of results is due to two main factors, the first is that the device designed adopts the isolation of the work of the target muscles completely, as the muscles targeted in the exercise of the mind are both muscles of the arms and shoulders in and during the performance are isolated from the rest of the muscles of the upper limb completely as well as the exercise of parallel diving as it works to isolate the lower part of the pectoral muscle and bisps as well as the exercise of diving suspends work on the muscles of the chest during performance.

The second factor is that the conditions provided by the muscle balance training device, which are in all its forms, are unbalanced as all the bras of the device work in a balance-like manner, forcing the athlete to focus the exercise on the target muscles and distribute the strength of these muscles equally to get a balanced position during performance .

7. Conclusions

The use of the device designed by the researchers gave motivation and excitement to the performance of the players all the exercises. The precise application of exercises has led to the development of muscle strength and reduced differences on both sides of the body at the upper end. The use of the designer device has increased the effectiveness of muscles during exercise.

References

1. Beckmann, J., & Elbe, A. M. (2015). *Sport psychological interventions in competitive sports*. Cambridge Scholars Publishing.
2. Kazem, S.M., & Hussein, E. (2020). Electrical training of working muscles and their effect on some physical abilities and achieving the triple jump for youth. *International Journal of Research in Social Sciences and Humanities*, *10*(2), 304-310.
3. Evans, N. (2015). *Bodybuilding anatomy*. Human Kinetics.
4. Balyi, I., & Hamilton, A. (2004). Long-term athlete development: Trainability in childhood and adolescence. *Olympic Coach*, *16*(1), 4-9.
5. McMahon, T. A. (2020). *Muscles, reflexes, and locomotion*. Princeton University Press.
6. Liokaftos, D. (2017). *A genealogy of male bodybuilding: from classical to freaky*. Taylor & Francis.
7. Fletcher, G. F., Balady, G., Blair, S. N., Blumenthal, J., Caspersen, C., Chaitman, B., ... & Pollock, M. L. (1996). Statement on exercise: benefits and recommendations for physical activity programs for all Americans: a statement for health professionals by the Committee on Exercise and Cardiac Rehabilitation of the Council on Clinical Cardiology, American Heart Association. *Circulation*, *94*(4), 857-862.
8. Kraemer, W. J., & Fleck, S. J. (2005). *Strength training for young athletes*. Human Kinetics.
9. Kraemer, W. J., & Ratamess, N. A. (2004). Fundamentals of resistance training: progression and exercise prescription. *Medicine & science in sports & exercise*, *36*(4), 674-688.