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EFFECT OF RESISTOR DIVERSITY EXERCISES BY MOVING CONTRACTION OF MUSCULAR LABOR EXCHANGE ON THE EXPLOSIVE POWER OF THE DOMINANT ARM AND THE ACHIEVEMENT OF THRUST GRAVITY

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ABSTRACT

The research aimed to prepare specialized exercises for the dominant arm in which there are various resistors with mobile contraction to exchange muscular work for young weight push players, and to identify the effect of exercises of diversity of resistors by mobile contraction to exchange muscle work in the explosive ability of the dominant arm and the achievement of pushing the weight of young players, to assume that the researcher that there are statistically significant differences between the results of the pre- and post-tests of the experimental and control research groups in the explosive ability of the dominant arm and the achievement of pushing the weight, and there are statistically significant differences between the results of Tests of the experimental and post-control research groups in the explosive power of the dominant arm and the achievement of weight push The experimental approach was adopted by designing the experimental and control groups on a sample of (12) players representing (85.714%) of their original community, deliberately selected from the young players in the weight push event at the Army Sports Club who are continuing their training for the sports season (2022-2023). Then they were divided into two experimental and control groups, and after determining the tests, the researcher prepared the specialized exercises represented by the independent variable in this research and experimental at the beginning of each training unit for a period ranging from (10-15) minutes, and at a rate of (3) units per training week and for a period of (10) consecutive weeks, and a total of (30) training units taking into account the principles of modern sports training, and after the completion of the experimentation, the results of the pre- and post-tests were processed with the (SPSS) system to be the conclusions and applications that the application of exercises of the diversity of resistors by moving contraction to exchange Muscular work helps in the development of explosive ability and in improving the increase in the achievement distance of weight pushing young players, It is necessary when training the dominant arm in order to develop the explosive ability to take into account the specificity of the effectiveness of pushing the weight and the need for its young players to develop at its level by adopting the scientific foundations of the principles of modern sports training in this planning and its ripples and appropriate training methods to avoid players fatigue or stress.

Keywords: Variety of resistors, mobile contraction, muscle work, explosive ability, push gravity

The research problem and its importance: The explosive ability of the pushing arm is one of the most important components of the movement of the effectiveness of pushing the weight, and its development requires standing on how to develop the two components of this physical ability represented by both the maximum strength and speed of muscle contraction, and as it is known

that the speed of muscle contraction is governed by what the weight pusher inherits from his parents For the type of muscle fibers and being also dependent on physiological characteristics, such as the control of the nervous system over skeletal muscles, and the ability of the cardiovascular system to supply oxygen and fuel to the working muscles to bring out the motor speed of muscle contraction, thus, arm speed training depends on training the force of contraction of its muscles, as well as increasing the ability of the nervous system to control the amount of contraction required for this ability. Hence, the dominant arm possesses characteristics that return to the neuromuscular control necessary to produce this physical ability, which if the level of its productivity increases, it will return. Positively increasing the achievement distance of the weight ball pusher, as Hassan points out that "(Stepler) defines muscular strength as the ability of the muscle or muscle group to overcome several external resistance or resistances, and (Mateev) also defines it, quoting Ali, as the ability of the muscle to overcome on different resistors. (Hassan, 2011), and it is also defined as "the basic element for achieving achievement in most physical and sports activities. With regard to the term (job), it is the work of the individual that is assigned to him, whether he is an athlete or not, as all of these works require many abilities to do." . (Majid, 2017) Also, "muscle strength plays the main role in improving performance and preventing sports injuries, as the information available not long ago indicated that muscle strength is the basic rule and an important requirement for almost all sports." (Michael & Other, 2007, p. : 11-12), and "muscle strength cannot develop in all its forms unless it is exposed to appropriate resistances that suit the goals of strength development." (Bhatt & et al 2015, 730-738), as it is possible to obtain the greatest sufficiency of muscle work when the muscle contracts at a moderate speed, and in the case of slow contraction or without motor output, large amounts of maintenance heat will be lost during The contraction process, despite the fact that no work is done or little work is done, and thus the adequacy of muscle contraction decreases, and the highest effectiveness is obtained when the contraction speed reaches (30%)" (Sylvia, 2001). From here it is clear that all types of muscular strength depend in their development on exposing them to the burden of resistances of all kinds and the amount of them placed on the muscles whose strength is required to be developed. The explosive ability depends on the ability of the body to produce the maximum force in the shortest possible time. Improved coordination of muscle fibers and utilization of energy storage and release mechanisms in muscles, Which leads to an increase in the explosive capacity of the muscles." (LARKIN & O'LEARY, 2017), as it is "the explosive movement (explosive capacity) with which the athlete produces the largest amount of force and at the highest possible speed, and in order for the athlete to train on this movement as quickly as possible, he must The weight for the resistance used is light until the goal of the training is achieved." (Duffield & Bishop, 2019), while "the strength of the weight-push arm is the force used by the athlete to push the ball or weight in athletics, and this movement is part of the sport of discus and javelin throwing, Where the athlete extends his arm and then pushes the ball or weight as hard as possible through the air, thus, the strength of the weight push arm depends on muscular strength and the correct technique of movement. The athlete must develop the muscle strength necessary to carry out the movement with sufficient strength and effectiveness, and it also requires training in the correct technique to transfer the greatest amount of force to the ball or weight (John & Art, 2020). Thus, "strengthening the arm that pushes the weight is important to increase the

level of pushing the weight In athletics, by improving the performance of explosive movements, which require the production of high strength in a short period of time, especially in exercises that require the use of muscle strength to throw weights or perform strong movements with the arms, to strengthen the arms, as a variety of exercises that target this area can be practiced effectively. (BRYAN & BELCHER, 2018) "Muscular exchange of work is an important concept associated with explosive power and refers to the ability to generate force and movement at high speed. Muscular exchange of work occurs when the muscle works to stretch before contracting, and when the muscle is stretched, kinetic energy is stored They are then released in the subsequent muscle contraction to generate a fast, powerful force and movement." (COTE, 2020), "Thus, "exercises that focus on mobile contraction and exchange of muscle work work to develop fast-twitch muscle fibers and improve coordination between the nervous system and muscles, this contributes to increasing the ability to jump, run fast, and explosive power in different types of sports such as long jump, weightlifting, ball throwing, and others." (Ryan, 2018) That the time period for this rotation must be very fast, with a very fast performance as well, as this final position begins the moment the foot is placed in front of the circle in a position in which the athlete is twisted and the shoulder axis intersects with the pelvic axis completely, and the athlete's gaze is directed backwards, Then the propulsion movement begins from the continuation of the rapid rotation of the body, in which the pelvic rotation movement precedes the torso rotation movement in order for the player to face the push with the chest, and then he makes a quick and strong pushing movement with all parts of the body, investing in the transmission of kinetic momentum between them, i. With a strong wrist movement in which the legal stages of performance end, and thus the principle of specialization in sports training calls for dealing with the details of this performance in training the most important working muscles in harmony with the proper performance of pushing the weight, and the good rationing of muscle exercises by investing the principle of diversity, and the principle of muscle exchange in modern sports training. As "there must be rationing in the components of the loads of intensity, size and rest so as not to cause any health, physical or technical harm to the athlete." (Al-Ali and Shaghati, 2006), and that "muscle strength development exercises make the player more able to deal with the requirements of the game." Specialization. (Sabr, 2010), and thus the impact on the strength of this contraction from external sources must be directed towards the merits of the mechanism of neuromuscular action and the nature of the movements in their exercises with single muscle contractions in these exercises, "and here the trainer must realize that technology is a friendly tool for him It is not a substitute for it, and it is complementary to what it prepares, and what is important in the matter is its proper use and the appropriate attitudes to use it for the benefit of the trainee, achieving the objectives of the training process and facilitating innovative work in the training units." (Obeid, 2010), Through the researcher's work as a coach for various athletics activities for most clubs in Baghdad, he noticed the poor achievement of most of the young weightlifting players who aim to advance the level of this achievement in continuing their training, despite their utmost efforts to improve it in a way that suits the requirements of this event. The problem was seeking to find ways that call for experimenting with exercises of a variety of resistances by mobile contraction to exchange muscular work, so that the research aims to prepare specialized exercises for the dominant arm in which there are various resistances by mobile contraction to exchange muscular work for young weightlifting

players, and to identify the effect of exercises of a variety of resistances by mobile contraction to exchange muscular work In explosive power of the dominant arm and weightlifting achievement of young athletes, So the researcher assumes that there are statistically significant differences between the results of the pre and post-tests of the two experimental and control research groups in the explosive power of the dominant arm and the achievement of weight pushing, and there are statistically significant differences between the results of the experimental and control research groups' posttests in the explosive power of the dominant arm and the achievement of weight pushing.

Research methodology: imposing a solution to the existing problem, the researcher's adoption of the experimental research methodology, which is defined as "a pattern of research in which the researcher controls one or more variables to bring about a deliberate and controlled change to the specified conditions and interprets the results of this change." (Mohammed, 2016) The experimental design with two groups, the experimental and the equal control, was also adopted with the control of the pre and post-tests.

The research population and its sample: The boundaries of the community of this research are the young players in the effectiveness of weightlifting in the Army Sports Club, which numbered (14) players who are continuing their training for the sports season (2022-2023), from which (2) players who are not committed to training were excluded, then a sample was selected The search was done by the intentional method of (12) players representing (85.714%) of their original community, then they were divided in an equal number into two groups, experimental and control, as required by the experimental design. For the dominant arm by pushing the weight, as the researcher proceeded to the qualitative analysis of the characteristics of the total research sample, which appeared from those whose dominant arm is the right, and they are (10) players, and (2) two players whose dominant arm is the left, as they were distributed at the rate of one player for each of the two research groups, and homogenization was also conducted for them in some extraneous variables that affect In the internal safety of the experimental design, in which the values of the torsion coefficients ranged for each of the variables of total body length (0.289), body mass (0.043), chronological age (-0.115), and training age (-0.701), and they are defined between (+1), Also, (4) players were selected from them for the survey sample, at a rate of (28.571%) from their original community. Their players were chosen randomly from the same two groups, at a rate of (2) two players from each group.

Measurement and procedures: The test of throwing a medical ball weighing (2) kg with one arm over the head from the standing position was adopted with a unit of measurement (the meter and its parts), and the test of achieving the weight push according to the competition conditions and in accordance with the law in the International Bulletin of the Federation of Athletics (2022), then baptized The researcher to the preparation of the exercises were taken into account individual differences according to the principles of sports training in the specificity of the training of each player and according to his dominant arm by pushing, and by referring to what was stated in the reference framework for explosive power exercises that fall within the first system of vital energy by adopting the two methods of high-intensity and repetitive interval

training, as these exercises contained a variety of resistances by mobile contraction to exchange muscular work by diversifying between the contractions of the muscles of the dominant arm by pushing the weight and using various resistances to train the muscles of this arm, to include movements of acceleration, stabilization and deceleration in order to improve its explosive ability, by adopting without harming the balance of training the opposing muscles in an equal manner, As it was "determining the intensity of each exercise in which the resistances vary = the largest horizontal distance achieved by throwing the ball, pulling the rubber rope, or lifting the free weight (bar) or (dumbbells), which represents the maximum intensity, and the required intensity is by multiplying the ratio to the maximum distance." (Chad, 2005), for example, the player throws the medicine ball as far as possible, so that the distance achieved is the maximum intensity (14) meters, so extracting the intensity (80%) from this distance is (11.2) meters, and it is determined by a plastic indicator measuring (10) cm on the The playing field, and so on to determine the rest of the tension. As for the repetitions, it was proportional to the type of exercise and the number of players in the training unit, and the rest periods between repetitions (5 seconds), between sets (60 seconds), and between one exercise and another according to the determinants of the phosphogene energy system between (2-5) minutes, and the training intensity was limited to between (75-100%) according to the two training methods mentioned, and by adopting a descent of (75%) intensity for two training units only, And (100%) for a training unit, and the principles of gradualism and undulation were taken into account in planning and applying exercises in the period of special preparation, which was at the beginning of each training unit for a period ranging from (10-15) minutes, (Appendix 1) and at a rate of (3) units per training week one (Sunday, Tuesday, and Thursday), for a period of (10) consecutive weeks, with a total of (30) training units, as shown in Figure (1):

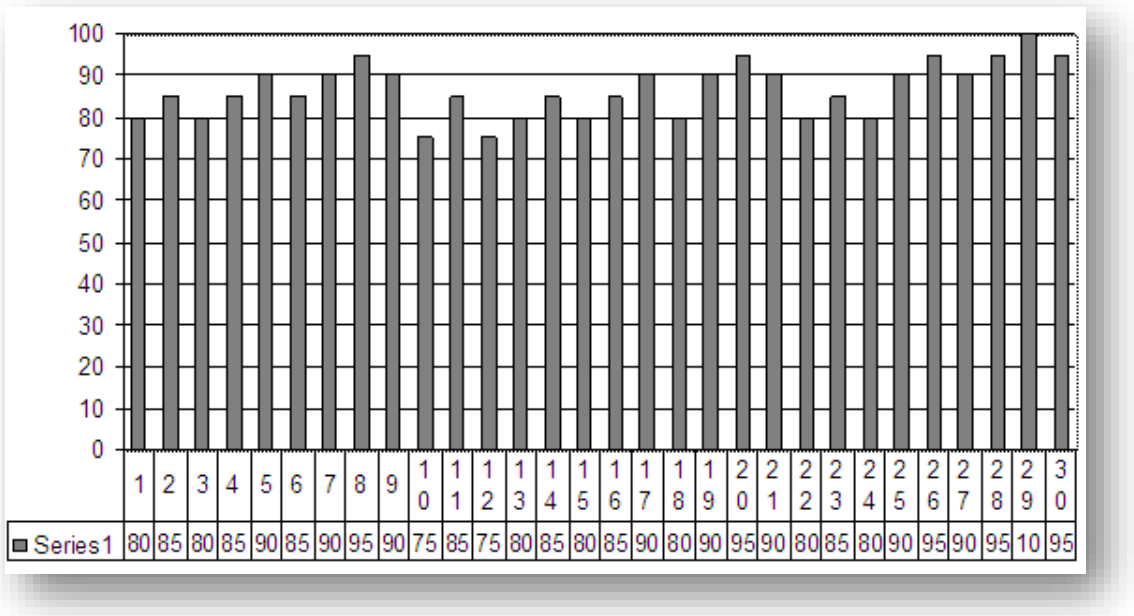

Figure (1) illustrates the planning of applying a variety of resistance exercises by moving contraction to exchange muscular work

As for the control group, it was satisfied with the exercises followed with them in the Army Sports Club, as this application began after conducting the pre-tests for the two research groups

to measure each of the dependent variables under study on Thursday corresponding to the date (12/22/2022), then the experiment ended with the application of the post-tests On Sunday corresponding to (3/5/2023), then the results were processed by the statistical bag system (SPSS). The percentage values, the arithmetic mean, the standard deviation, the t-test for correlated samples, and the t-test were automatically calculated. (t-test) for uncorrelated samples.

RESULTS AND DISCUSSION

Table (1) shows the results of the pre-tests between the two groups in the dependent variables

Two tests are in a unit of measure ((meter	groups	The number	Arithmetic mean	Standard deviation	Levine for contrast smoothing	(Sig)	(t)	(Sig)	Difference significance
The explosive power of the dominant arm	Experimental	6	11.5	0.837	0.238	0.636	1.136	0.282	Insignificant
	Control	6	12.17	1.169					
Weightlifting achievement	Experimental	6	13.67	1.033	0.552	0.475	0.319	0.756	Insignificant
	Control	6	13.83	0.753					

Insignificant if (Sig) < (0.05) at the degree of freedom (total n) - (2) and the level of significance (0.05).

Table (2) shows the results of the pre and post tests for the two groups in the dependent variables

The two tests are in a unit of measure (meter)	Group and its number	Comparison	Arithmetic mean	Standard deviation	average variances	deviation of variances	(t)	(Sig)	Difference significance
The explosive power of the dominant arm	Experimental(6)	Pre	11.5	0.837	2.667	0.816	8	0.000	significant
		post	14.17	0.408					
	Control (6)	Pre	12.17	1.169	0.833	0.753	2.712	0.042	significant
		post	13	0.894					
Weightlifting achievement	Experimental(6)	Pre	13.67	1.033	2.833	1.169	5.937	0.002	significant
		post	16.5	0.548					
	Control (6)	Pre	13.83	0.753	0.833	0.408	5	0.004	significant
		post	14.67	0.816					

Significance of difference (Sig) > (0.05), degree of freedom (n) - (1) for each group, significance level (0.05).

Table (3) shows the results of the post-tests between the two groups in the dependent variables

The two tests are in a unit of measure (meter)		number	Arithmetic mean	Standard deviation	(t)	(Sig)	Difference significance
The explosive power of the dominant arm	Experimental	6	14.17	0.408	2.907	0.000	significant
	Control	6	13	0.894			
Weightlifting achievement	Experimental	6	16.5	0.548	4.568	0.000	significant
	Control	6	14.67	0.816			

Significant difference (Sig) > (0.05) at the degree of freedom (total n) - (2) and the level of significance (0.05).

From reviewing the results of Table (2), it is clear that the players of both the experimental and control groups have developed both explosive power and weight-bearing achievement in the results of the post-tests compared to their results in the pre-tests. From reviewing the results of Table (3), it is found that the players of the experimental group They were more developed than the players of the control group in the results of the post-tests for these two dependent variables, and the researcher attributes the emergence of these results for the young players by pushing the weight in the experimental group to the positive effect of the exercises of the variety of resistances by moving contraction to exchange muscle work, which took into account the accuracy of the specificity of the arm movements of the weight pusher in the circle, which was characterized by multi-directional contractions according to the specificity of the pushing movement, as the point of impact of the resistances was directed according to the systolic action of each muscle of the arm by multiplying the type of resistances in the same training unit itself and with cautions to avoid excessive training that leads to fatigue, especially for the dominant arm, so that the player can take a training session for each A muscle of the arm muscles with this diversity and exchange, in which the researcher stipulated that the muscular work should be similar in conformity with the performance in the achievement of this activity, considering that the muscular work in each rotational movement is to engage the systolic muscles at the initial shortening to produce the explosive power driving the weight, which adopts three types of muscular work for the muscles of the dominant arm, which are either working, stabilizing, or opposite, and from here it imposes the principle of comprehensiveness dealing with such work Muscular mobile that the exercises cover their goals in targeting the comprehensive development of the muscles involved in the technical performance of accomplishing the weight push, as this development came as a result of the improvement of biological factors in increasing the neuromuscular control to produce explosive power at this level and outperforming their peers in the control group, in addition to the positive role in the appropriateness of the components of the training load in terms of intensity, repetitions, rest periods, the number of training units and weeks in the two methods of high-intensity and repetitive interval training, the good descent and ascent with the wave of the load cycle in the period of special preparation and the good distribution of exercises in one unit, as "it is necessary to know the nature of work

muscle and its direction to help in how to direct the movement of contractions by varying the resistances and diversifying the muscular work according to the most common classifications in the physiology of sports training represented by the fixed muscle contraction (isometric), lengthening (isotonic/eccentric) muscle contraction, shortening (isotonic/central) muscle contraction, reverse (plyometric) and (isokinetic) muscle contraction." (Maleh et al., 2011) In skill, the training program should focus on the muscles working in the performance itself." (Frizzell & Dunn, 2015) Also, "the term (resistance training) is sometimes used as a substitute for muscle strength training, and resistance exercises are used to develop muscle strength and increase muscle size." Structural, and there are different methods of resistance training, the most common of which are gravitational forces, rubber and hydraulic resistances, they are common methods for training muscle strength, where gravity works (ropes, weights, discs, and dumbbells) or hydraulic and rubber resistances against muscle contraction, and it is possible to train muscle strength without weights that impede the movement of the hands through ligaments and free weights exercises." (Faraj, 2012), that "Developing arm strength by diversification has many benefits, the most important of which is the balance of muscle development, as when you vary exercises between muscle contraction and static, a variety of muscles in the arms are stimulated, including the biceps and triceps muscles, this helps balance muscle development and avoid Overlooking the strengthening of certain muscles at the expense of others." (Baker & Other, 2023), also, muscle training in both directions enhances the general strength of the ability, so when practicing sports that require pushing weight, the strength of the arms will play an important role in improving performance and developing achievement, and balancing the strength of the arms helps reduce the chances of injury due to unbalanced muscle load or excessive Tension on the joints of the arm, and increasing the ability to control the strong movements of the arms when contracting and steadfast are very important in athletics, and the development of motor control helps to improve accuracy and balance in performing exercises and sports movements directly related to technical performance and achievement. " (Seitz & Other, 2022), as "all the physical activities of the player lead to the occurrence of many physical changes, but when these activities occur on the body according to regular scientific rules, it then leads to improving achievement." (Jamil, 2010), "and that sports training leads to the occurrence of various physiological changes It includes all vital body systems, and these changes occur at the level of cells and tissues as well, and due to the breadth and depth of dealing with the physiology of sports in recent years, researchers were able to obtain important physiological information and facts that contributed to the development of sports training. (Al-Amin, 2018), and that the diversification between muscle contraction and the constant in arm strength development exercises is of great importance in strength sports and athletics. This diversification includes the ability to strengthen the muscles when contracting (when the arm is bent) and when steadfast (when the arm is extended), because the total strength of the arms lies in Stamina and control of powerful movements in both directions. (Thomas & Newton, 2017) "The factors affecting the production of muscle force are determined by the number of muscle fibers excited, the cross-section of the muscle or muscles involved in the performance, the composition of the muscle fibers, the angle of muscle force production, the length and relaxation of the muscle or muscles before contraction, and the length of time the time it takes for a muscle to contract, and the degree of coordination of the muscles involved in

the performance, and the emotional state of the player before and during the production of muscle strength, age, gender, and warm-up." (Salman et al., 2010). Diversity and exchange to include most muscles with the effect of the resistances, provided that each resistance is proportional to the size of each muscle and the type and direction of its work in that skill." (Mc Bride & Other, 2022).

CONCLUSIONS AND APPLICATIONS

1. The application of a variety of resistance exercises with mobile contraction to exchange muscular work helps in developing the explosive ability of young weightlifting players.
2. The application of a variety of resistance exercises by mobile contraction to exchange muscular work helps in improving the distance of achieving the weight push for young players.
3. It is necessary when training the dominant arm in order to develop the explosive ability to take into account the specificity of the effectiveness of pushing the weight and the need of its young players to develop at its level by adopting the scientific foundations of the principles of modern sports training in this planning and its ripples and appropriate training methods in order to avoid fatigue or stress for young players.

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