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The Effect Of Using A Proposed Assisting Exercises Via Weights In Developing Isotonic And Isometric Muscular Contraction Maximum Strength Of The Marche And Romper Skill Of Fencing Players

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Abstract:
The researcher's wide knowledge and reading led him to think that the training of maximum strength development came by many methods, including muscles isotonic and isometric contraction trainings. In improving the maximum muscle strength and keeping it at its highest level. The researcher decided to discuss this topic, and the research aims to identify the effect of muscles isotonic and isometric contraction in developing maximum strength of the Marche and Romper skill of fencing players, , and the researcher used the experimental method to suit the nature and problem of the research and he used the appropriate means and tools for his research, then he conducted the exploratory experiments and the pretests and applied his exercises in the main experiment, then he conducted the post tests in the same conditions as the pre-tests and extracted the results using the statistical bag Spss, and through his research he concluded that it is possible to develop maximum strength using either of the two training methods (isotonic – i sometric).

1- Introduction

The scientific development that took place in all sports fields was not happen by chance. Rather, it was due to serious and continuous scientific research that aims to raise the competence of players and improve their level to ensure the achievement of the best sporting achievements. Among these areas is the field of sports training that aims to improve physical, skill and mental abilities to reach. One of the important indicators that increase with the progress and improvement of the training situation is the difference observed between the maximum levels of muscle strength, which is "the degree of continuous partial contraction (partial tension) and invisible in the muscles of the body, that mean that the muscle in its normal state is partially contracted. That is, in a state of readiness and ready to work

and for this characteristic of great importance in sports that depend on the " .immediately element of surprise, such as fencing, which has witnessed a continuous improvement in the level of performance of its fencers and the results of their matches, adding technical and planning requirements that must be taken into account when implementing the training curricula for fencing, and also requires a great effort that does not stop at training, but rather This goes beyond that to the possibility of its performance, which represents in the process of attack, defense, in addition to the movements of Marche and Romper, and it is submit to change and continuous development that occurs as a result of the creativity of coaches and players as well as changes to the law of the game, so it is directly reflected in the performance of technical skills and their evaluation. (Abd Ali and others, 1990, 18) , The degree of most fencing skills winning requires special physical characteristics characterized by a high degree of development in the joints and muscles working in motor performance, and among these qualities is (maximum strength), and to develop this trait there are a number of methods, including: (isotonic - isometric) and the importance of strength the maximum performance of skills, the maintenance of the center of gravity and the resistance of the opponent's skills, and because of maximum muscle strength characteristic is important in preparing agonist muscles for motor performance with a full range of motion without injury to the joints and muscles. Their effect is to improve the maximum muscle strength and maintain its highest level. As for the research problem, it lies in the fact that most of the injuries that occur in most sports in which the requirements for motor performance are the sudden change in performance, i.e. from relaxation to muscle tension for the purpose of attack or defense, it is either to the lack of rehabilitation of the participating muscle groups with the correct motor performance or the weakening of the maximum muscle strength of those muscles. The game of fencing in which offensive, defensive and compound skills are performed, in addition to all counter attack skills, require a sudden offensive and defensive positions as they require contractions and diastoles from the participating muscle groups, so rehabilitating them and improving their maximum muscle strength prevents injury to those muscles (Muhammad Samir, 2000, 48) And through the researcher's acquaintance on many scientific sources, he found that training of the development of maximum strength came by many methods, including training with muscular work isotonic - isometric in improving the maximum muscle strength and keeping it at its highest level. The researcher decided to deal with this problem and the research aims to identify the effect of isotonic - isometric muscular contraction on developing the maximum strength of Marche and Romper skill of fencing players, and the researcher assumes that there are significant differences between isotonic contraction and the skill of marche and romper , and developing the maximum strength for the fencing players and for the benefit of the post tests, the presence of significant differences between the development of the maximum strength

by working the static and moving muscular work in developing the maximum strength and the skill of marche and romper of the fencing players and in favor of the post tests.

2- Research methodology and field procedures:

2-1 Research Methodology:

The researcher used the experimental approach of equal groups for its suitability to the nature of the research, and that the experimental research aims at events "a deliberate and controlled change of the specific conditions for an event while observing the realistic changes in that event and their interpretation" (Sami, 2000, 359).

2- Research sample:

selecting a sample is one of the main steps in collecting data and information, and the researcher often resorted to determining a research community based on the phenomenon or problem that he chooses, ie: “The researcher chooses a sample in which he sees that it faithfully represents the original community in which he studies it” (Muhammad Hassan and Muhammad, 2000 The sample selected by the researcher by the deliberate method is the Diyala Sports Club in fencing, totaling (15) fencers, and ages (15-17). The sample was divided into two experimental groups, (5) players for the experimental group that train according to isotonic contraction muscles work and (5) Players for the experimental group that train according to the isometric muscular contraction , where 2 players of each of the weights mentioned below were chosen and a draw was made for them by choosing the experimental group in which the training will take place whether isotonic or isometric, as well as the researcher conducted maximum strength tests of the two groups for the sake of parity and their beginning with a single initiation line for training, where homogeneity took place in one group in terms of variables (length, age, training age, and the maximum (relative) strength of the isotonic or isometric, and it was done an Equivalence between the two groups with the same variables, as well as the maximum muscle strength in the state of relaxation and the maximum muscle tension of the muscles. The homogeneity was done by the coefficient of variation, and the results showed the homogeneity of the sample, as the values of the coefficient of variation were limited to (30). The closer the coefficient of variation to (1%) is high homogeneity, and if it exceeds (30%), the sample is not homogeneous. (Wadih, 1999, 161) Equivalence between the two experimental groups was performed with the variables showing the arithmetic mean, and the standard deviations of the variables adopted by parity and the significance of the differences between the two groups, as it is clear that the calculated (t) values were less than the tabular (t) values less than the significance level

(0.05) And in front of the degree of freedom (8), which reached (1.86), which indicates the absence of significant differences between the two experimental groups in the variables adopted in parity, and this indicates the equivalence of the two groups.

2-3 Means, tools and devices used in the research:

2-3-1 data collection Methods:

- Arabic and foreign scientific sources.
- Observation and experimentation.
- Personal interviews.
- Data collection form.
- Data writing form.
- Tests and measurements.

2-3-2 Tools and devices used in the research:

- Tape for measure length.
- A German-made electronic scale to measure the weight of the nearest 50 grams.
- 4 electronic stopwatches (Kenko).
- 2 iron bras to hold weights, counters, bars, various iron discs of multiple weights (2.5, 5, 10, 15) kg.

4- Tests and measurement used:

2-4-1 maximum strength tests (arms, back, legs) with isotonic muscle contraction

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2-4-1-1 Bench press at (90^0) test (Muwaffaq Saeed, 2002, 172)

2-4-1-2 Isotonic Back Strength test: (Muhammad Ibrahim and Muhammad, 1995, 59)

2-4-1-3 Isometric Back Strength legs test: (Muhammad Ibrahim and Muhammad Jaber, 1995, 59)

2-4-2 Maximum strength tests (arms, back, legs) of muscular contraction :

2-4-2-1 Bench press test (Mowafak Saeed, 2002, 172)

2-4-2-2 Back Muscle Strength Test (Deadlift): (Qasem Hassan and Bastawisi, 1979. 134)

2-4-2-3 Back Squat Test : (Mowafak Saeed, 2002, 172)

2-5 Scientific foundations of the tests :

2-**5-1 Test validity:**

(Barrio and McGee) indicated that validity means "the extent to which the test performs the purpose for which it was set, as validity varies according to the purposes to be measured and the test that is carried out to prove it." (Mohammed Subhi Hassanein, 1995, 183). Thus the researcher tried to find the tests self-validity coefficient, and the measurements under discussion, as the value for this work is calculated through the square root of the reliability coefficient as shown in Table (1).

3-4-2 Test stability:

test stability considers one of the basic components of a good test, and "Mohammed Subhi" by Van Dalin mentioned that "the test is considered constant as it used to give the same results constantly, as it was not applied repeatedly to the same subjects, and under the same conditions." (Muhammad Sobhi, 1995, 186). To find the consistency of the test, the researcher used the re-test method, and the test were applied to a sample consisting of (5) players from the research sample and they were excluded, and the test was concluded at 10/16/2019 and after (7) days had passed the same test was repeated, at 10/23 / 2019, in the same conditions, and the place and on the same sample, after which the researcher used the simple correlation coefficient (Pearson) law between the two tests to find the stability of the tests, and the results showed that the tests have a high degree of stability, as shown in Table (1).

3-4-3 Test objectivity:

Objectivity is intended to maintain constant information of various individuals who are being tested in a single movement component. (Qais Naji and Bastwissi, 1984, 35) For the sake of validity of Isotonic and Isometric Contraction tests for arms, back and legs, and measurements of maximum muscle strength, the researcher presented the tests and measurements and took expert opinions. On the subjectivity of the tests and measurement, as well as the ease of carrying out the tests and the use of devices such as dynamometers and weights as tools to measure the exerted force, as well as a tonometer to measure the maximum muscle strength and distance from self-evaluation, i.e. the personal bias factor in the calendar, make it more objective.

Table (1)

It shows the stability coefficient and self-validity of the research sample in Isotonic and Isometric Contraction tests muscle action and some measures of muscle tone

Tests	stability coefficient	Validity Coefficient

Bench press test	0.88	0.94
Bench press at (900) test	0.89	0.94
(Deadlift)Test	0.91	0.95
Back Lift Strength Test. Dynamomete	0.94	0.97
The Back Squat test	0.90	0.95
Legs Strength Test. Dynamomete	0.93	0.96
maximum muscle strength test of relaxed deltoid muscle	0.96	0.98
maximum muscle strength test of tensioned deltoid muscle	0.97	0.98

2-5 Exploratory experiment:

The exploratory experience is a scientific training for the researcher to find out the negatives and positives of the test in order to avoid them. (Qasim Hassan and others, 1990, 107), as the researcher conducted the measurements of the maximum muscle strength by a Tonometer to measure the maximum muscle strength in the state of relaxation and the maximum muscle tension of all muscles of (5) players ,out from the research sample. This experience refers to the muscles that can be measured to find out their muscle tone, which is the muscle that can be determined from its origin, as well as its presence on the mesial side of the human body, such as muscles (deltoid, trapezoidal square, biceps and three heads of the humeral, pectoralis, the spinal sacral, the rectus abdomen, the gluteal, the straight thighs, the biceps and the thighs) , Which cannot be measured are those that are on the lateral side under these muscles or have a thin fibrous structure. A tension point cannot be obtained that can be measured with a tonometer. Excluding them when performing basic research procedures, in order to identify: the validity of the set of tests for the sample, the validity of the tools and devices used for the tests, the extent of enumerating the work team (for training and tests) and its sufficiency, reaching the best

way to conduct the tests, identifying the time required to implement the exercises used in the research, the extent to which the research sample understands the used tests.

2-6 Pre-tests:

The maximum strength pre-tests were conducted on (12/8/2019) and measurements of maximum muscle strength were conducted on (8/13/2019). The other (maximum muscle strength) was measured for the muscles discussed in this research

2-7 Main experiment :

❖ **Isometric Contraction Muscles:**

The researcher carried out the training of Isometric contraction performed by the players for the first experimental group for (8) weeks at a rate of three training units every week as the players perform the push-up exercise from lying down on the bench with a weight that each player raises according to its maximum intensity and at an angle of (90^0). The angle, by placing a piece of cork between the upper arm and forearm, taking into account the safety of the players from injury, by raising it directly when determining the required angle through it, and the players perform the dead lift exercise with a weight that each player raises according to its maximum severity, and then takes a position Stability according to the time period specified in the exercise. And perform the back squat exercise (half-dip) with a weight that raises each player according to its maximum intensity and at 120^0 as the angle is adjusted, by placing a piece of cork between the thigh and the player's leg during the player's implementation of the exercises, taking into account the the players safety from injury by raising it directly when determining The required angle through which, then the players perform the sitting exercise from lying down (sit-up exercises) with weights and stability according to the time period specified in the exercise from the working team in these exercises to load weights according to the intensity and the maximum strength of each player with full control over them. When the exercise starts and ends, it is necessary to take into account the organization between work and rest, as well as repetitions, and the number of groups the method of repetitive training in terms of intensity of exercises, rest periods, work, and number of groups.

❖ **Isotonic Contraction Muscles:**

The researcher observed the Isotonic contraction muscles exercises with the performed by the players for the second experimental group, through (8) weeks, at the rate of three training units a week, as the players perform the push-up exercise from lying down and on

the bench with a weight raised by each player according to its maximum intensity and according to the repetitions, rest periods and the number of groups. The players perform the dead lift exercise with a weight that each player raises according to its maximum intensity, and the players perform the back squat exercise with a weight that raises each player according to its maximum intensity. Procedures on exercises according to the objective of the training unit, training was carried out in muscular contractility, depending on the method of repetitive training in terms of intensity of exercises, rest periods, work and number of groups, and the main experiment was divided into three sections, namely (pre-tests, training curriculum, and post-tests). In the research, the researcher will discuss each section separately, trying to cover through the vocabulary obtained, taking into account the principle of abbreviation. On preserving the scientific facts and after the implementation of the pre-test, the training curriculum for the two research groups was started, as this curriculum was developed with fixed and moving muscular work after reviewing the principles of sports training science and its physiological theories in training, and benefiting from the observations of experts in the field of sports training. Implementation of the curriculum for (isometric and isotonic) training on the research sample by three training units a week, i.e. 24 training units are implemented as follows:

- The first experimental group implements the special training curriculum according to training with isometric –muscular training for (5) players.
- The second experimental group implements the special training curriculum according to isotonic-muscular training on (5) players.

The researcher took into account the following points in the implementation of each training unit:

- Starting the training unit with general warm-up to prepare all body muscles to work and for all members of the sample.
- Giving a special warm-up for flexibility and stretching the working muscles before starting to perform basic exercises for each training in muscle contraction exercises by all members of the sample.
- Exercising exercises with fixed and moving muscle work on the members of the two training groups, according to the curriculum set.
- Completing the training unit with all the sample members performing the calming and relaxing exercises.
- Three training units were conducted on (Saturday, Monday, and Wednesday) of each week, and the training was conducted in the afternoon. The training unit time took about (40-50) minutes as it represented the main section of the training unit.

- The intensity and times required to perform repetitions, rest periods between repetitions and the number of groups were determined through pre-tests to find out the maximum load for each player.
- Taking into account the gradation of loads ascending according to the stresses (75%, 80%, 85%, 90%, 95%) of the maximum load for each player, taking into account their gradual distribution over (8) weeks with (24) training units

2-8 Posttests:

After completing the implementation of the training curriculum in the same method of pre-tests and measurements, the tests and post measurements were carried out for the research sample (experimental groups) on (1/12/2020).

2-9 statistical methods:

The researcher used the Spss to extract the research results.

3- Results presentation and discussion:

1-3 The presentation of the research sample results for the (arms, back, and legs) tests, pre and posttest of the maximum strength of the two experimental groups with Isotonic and Isometric contraction muscles.

Table (2)

shows the values of arithmetic mean and the standard deviations of the pre and post tests, as well as the arithmetic mean of the difference between the pre and post means, their standard deviation, and the calculated value of (t) and a significant of the two groups (isotonic and isometric)

Experimental group	Tests	Pre-test		Posttest				Calculated T value	Significant
Isometric	Arms maximum strength (proportionality)	0.713	0.058	0.87	0.045	0.157	0.033	10.595	Sig.
	Back maximum strength (proportionality)	1.072	0.115	1.355	0.095	0.282	0.12	5.241	Sig.

	Legs maximum strength (proportionality)	0.94	0.065	1.183	0.052	0.243	0.051	10.621	Sig.
Isotonic	Arms maximum strength (proportionality)	0.69	0.046	0.833	0.079	0.143	0.036	8.845	Sig.
	Back maximum strength (proportionality)	0.985	0.022	1.221	0.04	0.236	0.025	20.989	Sig.
	Legs maximum strength (proportionality)	0.876	0.042	1.078	0.027	0.202	0.024	18.562	Sig.

* tabular (T) value less than the significance level (0.05) and the degree of freedom (4) is = 2.123

3- 2 Discussing the results:

By presenting and analyzing the results of the pre and posttests its clear that there are significant differences between pre and post tests of the two experimental groups Isometric and Isotonic muscular contraction and for favor of the post tests. The researcher attributes this development in the maximum strength in the post-tests of the regularity of the members of the two experimental groups in programmed training according to the scientific foundations chosen for the training curriculum, so that the effect of training on the results of the post-tests was clearly visible, and this is consistent with the principles of training science that indicate that training Programmed according to the correct scientific formulas and the principle of gradual increase, it has a positive effect for the trainees. Experiments have shown that strength increases through the application of the main principles of training increase in resistance, and the gradual increase principle means that in the case of muscle contraction or muscle group a regular contraction against one or more resistance from what it is accustomed to, there is an increase in muscle strength. (Muhammad Ibrahim and Muhammad Jaber, 1995, 55) "Also, reaching high levels is not achieved by chance , but rather as a result of organized training for a long time." (Qasim Hassan and Abd Ali Nassif, 1980, 11) The researcher also attributes the increase in the maximum strength to the maximum training loads on which the sample was trained during the course period, which led to an increase in muscle tension, which made the work of the participating muscles at the maximum possible energy by stimulating the largest number from the muscle fibers to the

generated nerve excitement, and to continue training at the higher loads for a while, which makes the muscle gain strength.

3-3 Results presentation of the experimental group with isometric muscular contraction Pre and post measurements of muscle strength in the state of relaxation of the discussed muscles

Table (3)

Shows the values of the arithmetic mean and the standard deviations of pre and post measurements of muscle strength in the case of relaxation of the muscles for the experimental group of isometric muscular contraction

Muscle	Test						Calculated T value	Differences: Indication
	Pre		post					
Deltoid	3.36	1.062	4.72	1.179	1.36	1.366	2.225	Sig.
trapezius	4	1.294	4.66	1.054	0.66	0.251	5.88	Sig.
biceps brachii	3.06	0.968	4.52	0.772	1.46	0.691	4.722	Sig.
triceps brachial	3.28	1.215	4.18	1.01	0.9	0.234	8.581	Sig.
pectoralis major	2.32	1.114	3.42	0.928	1.1	0.469	5.244	Sig.
sacrospinalis	4.16	1.862	5.268	1.382	1.08	0.778	3.182	Sig.
Rectus abdominis	1.08	0.294	2.12	0.327	1.04	0.35	6.631	Sig.
Gluteus maximus	1.72	0.311	2.62	0.438	0.9	0.212	9.487	Sig.
Rectus femoris	3.76	1.329	4.6	0.857	0.84	0.691	2.717	Sig.
biceps femoris	2.98	0.759	4.08	0.567	1.1	0.4	6.149	Sig.
Inferior Gemellus	5.08	1.3	6.02	0.816	0.94	0.502	4.179	Sig.

* tabular (t) value is less than the level of significance (0.05) and the degree of freedom (4) = 2.132

3-4 Results presentation of the experimental group with isotonic muscular contraction Pre and post measurements of muscle strength in the state of relaxation of the discussed muscles:

Table (4)

Shows the values of the arithmetic mean and the standard deviations of pre and post measurements of muscle strength in the case of relaxation of the muscles for the experimental group of isotonic muscular contraction

Muscle	Test						Calculated T value	Differences: Indication
	Pre		post					
Deltoid	4.12	1.127	5.46	0.702	1.34	0.634	4.72	Sig.
trapezius	3.86	1.021	4.88	0.544	1.02	0.878	2.596	Sig.
biceps brachii	3.54	1.457	4.7	1.095	1.16	0.585	4.429	Sig.
triceps brachial	3.66	1.087	4.78	0.502	1.12	0.719	3.483	Sig.
pectoralis major	2.08	0.983	3.62	0.949	1.54	1.066	3.228	Sig.
sacrospinalis	5	1.968	6.18	1.51	1.18	0.719	3.67	Sig.
Rectus abdominis	1.58	0.516	2.76	0.733	1.18	0.42	6.272	Sig.
Gluteus maximus	1.66	0.26	2.52	0.535	0.86	0.364	5.273	Sig.
Rectus femoris	4.52	1.818	5.02	1.544	0.5	0.463	2.411	Sig.
biceps femoris	2.86	0.581	3.82	0.486	0.96	0.439	4.886	Sig.
Inferior Gemellus	5.26	0.944	6	0.604	0.74	0.512	3.227	Sig.

* Tabular (t) value is less than the level of significance (0.05) and the degree of freedom (4) = 2.132

3-5 results Discussion :

The researcher attributes the development in the measurements of maximum muscle strength in the state of relaxation and its improvement in the post measurements of the two experimental groups to the nature of exercises and the weights used in the training curriculum by the two groups (isometric and isotonic). Muscle groups participating in the performance of the training, "as" organized sports training leads to an increase in the efficiency of the work of the muscular system and this is directly reflected in the ability of the muscles to produce force, whether motion or stationary. " (Abu Al-Ela and Muhammad Hassan, 1984, 15) and also that "a normal living muscle that (appears) completely relaxed (in its stable state) still has a small amount of tension." (Muhammad Tawfiq, 2000, 146) It is evident that the percentage change of the maximum muscle strength tests in the state of muscle relaxation for the muscles, the post measurements of the experimental group with isometric muscular contraction , is greater than the rate of the change in the experimental group with the muscular movement, except for the percentage of The change in the muscles (triceps brachial, pectoralis major and sacrospinalis) of the experimental group with isometric muscular contraction was less than the percentage of the change in the muscles mentioned above for the experimental group with moving muscle work. The muscular static of the post measurements was due to high level of neural activity. "When training strength and noticing the improvement in maximum strength within two weeks, it can be attributed to neurological changes that help the muscle to reach a better performance potential." (Komi, 1988, p. 386) and agrees with what Eddington and Eiderton (1976) " The increase in strength can be attributed to the adaptation of the muscle resulting from the increase in the intensity of the stimulus, or to the increase in the sequence of impulses to the motor units stimulated. "Holland Axel (1975) stated," When an individual's strength increases for 25% during strength training for a period of (8) weeks, part of this result is a result of nerve adaptation. "(Othman, 2004, 74) The researcher thinks that this improvement in the maximum muscle strength in a state of relaxation is of great importance in terms of muscle retaining a greater strength ratio that will increase the muscle's ability to perform its work efficiently, as well as this improvement in rehabilitation of muscle groups involved in work to perform some sudden high-tension movements, which prevents injuries that lead to muscle fibers laceration.

3-6 Presentation of experimental group results with isometric muscular contraction for pre and post measurements of muscle strength in the case of maximum muscle tension.

Table (5)

Shows the values of the arithmetic mean and the standard deviations of pre and post measurements of muscle strength in the case of maximum muscle tension for the experimental group of isometric muscular contraction

Muscle	Test						Calculated T value	Differences: Indication
	Pre		post					
Deltoid	7.72	0.975	10.08	1.241	2.36	1.069	4.936	Sig.
trapezius	8.08	1.7	9.56	1.502	1.48	0.238	13.861	Sig.
biceps brachii	8.48	1.616	11.14	0.472	2.66	1.436	4.141	Sig.
triceps brachial	7.56	0.589	9.2	0.62	1.64	0.415	8.817	Sig.
pectoralis major	5.2	1.051	6.92	0.828	1.72	0.46	8.353	Sig.
sacrospinalis	8.12	0.834	10.74	0.795	2.62	0.788	7.428	Sig.
Rectus abdominis	4.36	2.193	6.36	1.844	2	0.877	5.096	Sig.
Gluteus maximus	5.54	0.654	7.14	0.753	1.6	0.254	14.33	Sig.
Rectus femoris	7.76	1.15	9.3	0.514	1.54	0.887	3.879	Sig.
biceps femoris	6.2	1.894	8.22	1.306	2.02	0.673	6.718	Sig.
Inferior Gemellus	8.32	0.858	10.88	0.396	2.56	0.55	10.399	Sig.

* Tabular (t) value is less than the level of significance (0.05) and the degree of freedom (4) = 2.132

3-7 Presentation of experimental group results with isotonic muscular contraction for pre and post measurements of muscle strength in the case of maximum muscle tension.

Table 6)

Shows the values of the arithmetic mean and the standard deviations of pre and post measurements of muscle strength in the case of maximum muscle tension for the experimental group of isotonic muscular contraction

Muscle	Test						Calculated T value	Differences: Indication
	Pre		post					
Deltoid	8.56	0.466	12	0.821	3.44	0.75	10.252	Sig.
trapezius	8.28	1.63	10.92	1.325	2.64	1.628	3.624	Sig.
biceps brachii	8.2	0.754	10.74	0.572	2.54	0.658	8.631	Sig.
triceps brachial	8.04	1.7	10.5	0.768	2.46	0.996	5.52	Sig.
pectoralis major	5.36	1.443	7.92	1.398	2.56	0.923	6.198	Sig.
sacrospinalis	8.78	1.338	11.4	1.09	2.62	0.766	7.647	Sig.
Rectus abdominis	6.12	1.257	8.78	0.733	2.64	0.702	8.407	Sig.
Gluteus maximus	6.16	0.638	7.78	1.008	1.62	0.683	5.301	Sig.
Rectus femoris	8.06	1.966	9.6	1.35	1.54	0.618	5.564	Sig.
biceps femoris	7.26	1.158	9.4	0.992	2.14	0.676	7.071	Sig.
Inferior Gemellus	8.84	0.512	11.42	0.653	2.58	0.653	8.829	Sig.

*Tabular (t) value is less than the level of significance (0.05) and the degree of freedom (4) = 2.132

3-8 results Discussion :

The researcher attributes this significance, the increase in the post measurements of the two experimental groups of muscle strength in the case of maximum muscle tension of the muscles , to the strength of nervous excitation and the gradual increase in the amount of weights and resistances for the exercises used in the training curriculum as "with the increase in strength, the force of nervous excitation should be Which results in an increase in the training effect with athletes from (80% - 95%) and sports practice becomes beneficial for the training excitement of the force that special exercises can be similar to this amount or increase the strength than that, and the increase in muscle strength requires a continuous

increase in the strength of excitement Al-Asabiah. ”(Sulaiman Ali and Atif Muhammad, 1978, 131) “ This means that the muscle needs the amount of resistance it encounters in order to continue the process of gaining and growing muscle strength, and this is done by increasing the amount of weight or resistance used in training once the muscle adapts to it, as can be increase the volume of training by increasing the number of iterations or groups. " (Abu Al-Ela and Ahmad Nasr, 2003, 97), as "the force exerted during the maximal isometric contraction on the joints of the body depends on the amount of the joint angle that determines the length of the muscle, as the angle between the upper arm and the forearm plays a role as well as the angle between the thigh, the leg, the thigh, and the trunk. Significant in the force exerted during the maximal isometric contraction of the muscle groups "(Qasim Hassan and Bastawisi Ahmed, 1979, 109). Therefore," the development of the isometric force corresponds to the continuous increase in resistance as it is related to the degree of muscle tension in the muscle during work. " (Risan and Ali Turki, 2002, 97)

3-9 Results presentation of the research sample: the pre and post measurements of the difference between the magnitudes of muscle strength in a state of relaxation and the maximum muscle tension of the muscles for the two experimental groups with isometric and isotonic muscle contraction.

Table (7)

Shows the values of the arithmetic mean and standard deviations of the pre and post measurements of the difference between the amounts of muscle strength in a state of relaxation and the maximum muscle tension of the muscles for the experimental group with isometric muscular contraction

Muscle	muscle strength in the case of relaxation						Calculated T value	Differences: Indication
	Pre		post					
Deltoid	4.36	1.51	5.36	1.677	1	0.43	5.199	Sig.
trapezius	4.2	1.093	5.16	0.658	0.96	0.6	3.301	Sig.
biceps brachii	5.22	2.156	6.62	1.015	1.4	1.268	2.467	Sig.
triceps brachial	4.32	1.13	5.06	1.18	0.74	0.167	9.889	Sig.
pectoralis major	2.88	1.726	3.5	1.305	0.62	0.491	2.818	Sig.

sacrospinalis	3.96	1.604	5.48	1.651	1.52	0.465	7.296	Sig.
Rectus abdominis	3.26	2.062	4.24	2.008	0.98	0.576	3.803	Sig.
Gluteus maximus	3.88	0.414	4.54	0.403	0.66	0.054	26.944	Sig.
Rectus femoris	3.98	1.219	4.8	1.133	0.82	0.294	6.216	Sig.
biceps femoris	3.22	1.702	4.14	1.361	0.92	0.622	3.307	Sig.
Inferior Gemellus	3.26	0.887	4.86	0.065	1.6	0.412	8.677	Sig.

*Tabular (t) value is less than the level of significance (0.05) and the degree of freedom (4) = 2.132

3-10 Presentation of the results of the experimental group with isotonic muscular contraction, Pre and post measurements of the difference between the amounts of the maximum muscle strength in the state of relaxation and the maximum muscle tension:

Table (8)
Shows the values of the arithmetic mean and standard deviations of the pre and post measurements of the difference between the amounts of muscle strength in a state of relaxation and the maximum muscle tension of the muscles for the experimental group with isotonic muscular contraction

Muscle	Tests						Calculated T value	Differences: Indication
	Pre		post					
Deltoid	4.44	0.457	6.74	0.522	2.296	0.51	10.048	Sig.
trapezius	4.38	1.023	6.02	0.967	1.64	0.545	6.718	Sig.
biceps brachii	4.66	1.517	6.04	1.504	1.38	0.342	9.021	Sig.
triceps brachial	4.44	1.42	5.82	0.892	1.38	0.597	5.165	Sig.
pectoralis major	3.7	1.036	4.54	0.904	0.84	0.194	9.635	Sig.
sacrospinalis	3.86	0.723	5.36	1.04	1.5	0.374	8.964	Sig.

Rectus abdominis	4.54	1.566	6	0.628	1.46	1.089	2.995	Sig.
Gluteus maximus	4.3	0.707	5.18	0.719	0.88	0.408	4.815	Sig.
Rectus femoris	3.54	1.203	4.5	0.935	0.96	0.444	4.828	Sig.
biceps femoris	4.52	0.58	5.84	0.472	1.32	0.729	4.047	Sig.
Inferior Gemellus	3.58	1.441	5.42	0.668	1.84	0.95	4.33	Sig.

*Tabular (t) value is less than the level of significance (0.05) and the degree of freedom (4) = 2.132

3-11 Results discussion:

The researcher attributes this perceptible change to the muscle tone (difference) tests of the muscles in the post measurements of the positive effect in developing and improving the maximum strength of the muscles by measuring the tension force in the state of relaxation and measuring it with the maximum muscle tension. The largest percentage of change was the difference between the amounts of muscle tone. As a result of the post measurements of maximum tension, as "the increase in muscle stiffness during contraction and the increase in the degree of relaxation indicate an improvement in the functional state of the musculoskeletal system, and the better the training state, the lower the maximum muscle strength at rest and the increase in the state of muscular contraction." (Abu Al-Ela and Muhammad Sabhi, 1997 , 196).

This is indicated by :Qasim Hassan and Bastawisi Ahmad (1979), Muhammad Hasan Allawi, and Abu Ala Ahmad (1984) that "Training with these methods (isometric , isotonic and both) has a positive effect on the development of maximum strength, as well as a clear effect on increase muscle mass. " (Othman Adnan, 2004,74), "Muscular strength training with weights enhances bone density and strengthens the tendons, ligaments and connective tissues in the muscle, especially if this training contains weights and standardized weights appropriate to the capabilities of the players with the gradual increase in these loads according to the improvement of their abilities." That is: the nature of strength training represented by exercises with isometric and isotonic muscular contraction was concentrated in performing the largest number of repetitions during a specific period of time, this is an incentive to stimulate the largest number of motor units as a result of muscle contractions, which led to the adaptation of the nervous system to employ the largest number of units, And that this adaptation depends on it in tests of maximum strength, as this strength depends mainly on

employing the largest number of motor units, "that the maximum strength is directly related to the number of muscle fibers employed to perform the muscle contraction, and the total size of those fibers," as supported by Strauss (1979) that "the highest muscle tension can be produced by employing the largest number of motor units and increasing the sequence of nerve stimulation". Risan Khuraibet (1991) indicated that "the amount of muscle tension according to the amount of will and the (mechanical) rules for external movements, and the excitation issued according to the circuit the closed nerve (the reflex circuit) generates the appropriate muscle tension".

4- Conclusion:

The researcher concluded that it is possible to develop the maximum strength using either of the two training methods (isometric or isotonic), and the maximum muscle strength of some muscles can be improved by working the isometric muscle and others by working the muscular movement, that the muscular movement is the best for muscle harmony in terms of the change between relaxation and muscle tension to reduce sports injuries, and recommended to pay attention to training with isometric and isotonic muscular contraction gradually for weights by the trainers, with a distinction between them because of the benefits in developing the maximum strength as a result of the variation in the functional adaptations that occur to the muscle, and the necessity of training by working the isotonic muscular because of the retention of a higher level for muscle strength, and the need to conduct similar research to know the maximum muscle strength of muscles according to the type of sporting events and for other age groups.

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