The effect of exercises muscle sensory receptors for PNF in improving flexibility, arm muscle balance and achievement among weightlifting athletes under 17 years old.

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Abstract:

The purpose of this paper is to preparing exercises muscle sensory receptors (PNF) in improving flexibility, arm muscle balance and achievement among weightlifting athletes under 17 years old, identifying the effect of muscle sensory receptors (PNF) exercises in improving flexibility, arm muscle balance and achievement among weightlifting athletes under 17 years old, and identifying the superiority of the effect between exercises (control and experimental group) in improving flexibility, arm muscle balance and achievement among weight-pushing players under 17 years old. The researchers adopted the experimental method for its suitability to the nature of the problem to be solved. The researchers identified the research community as motivated by the effectiveness of pushing the weight under 17 years for the Al-Qadisiyah Governorate clubs, which numbered (eight clubs) who officially participated in the tournaments held by the Central Athletics Federation, which numbered (24), (4) players were excluded for the purpose of their participation in the pilot experiment, bringing the number of The research sample members (20) players, and they were divided into two groups, experimental and control, using a simple random method, by making a lottery. One of the most important results reached by the researcher is that: There is a positive effect of exercises muscle sensory receptor PNF in improving flexibility, arm muscle balance and achievement among weight-pushing athletes. One of the most important recommendations recommended by the researchers is that: Emphasis on performing exercises with the PNF muscle sensory receptors due to their importance in improving flexibility and balance of the muscles of the arms and achievement, conducting studies similar to this study for different age groups.

Introduction:

The world, especially in recent times, has witnessed clear progress in various research fields, where scientific research has become one of the most important necessities in our modern society in all aspects of life to reach the highest levels, including the mathematical aspect, in an attempt to achieve as much as possible benefit from the development of science that contributed to achieving high achievements. Including (psychology, biomechanics, kinetic learning .... etc.) and one of these sciences is the science of sports training, which has witnessed great strides in recent years, as the efforts of specialists and those interested in this field have multiplied to search for the best training methods and means to develop the physical and skill level that flows in the Improving the level of sporting achievement for all sporting events.The weight-push competition is one of the athletics competitions that involve under throwing activities, which is characterized by excitement, suspense, and intense competition between athletes, and this competition deals with the maximum physical potential that the athlete possesses, which is represented by rapid strength with the accuracy of motor performance from the first moment of performance to its end. The level of performance

in the effectiveness of pushing the weight is basically on the level of the quick force possessed by the weight thruster, as the level is determined by the elements of force and speed because this activity is characterized by the shortness of the acceleration path unlike the rest of the throwing and pushing activities, as well as the need to give very strong pushes in a short period of time, especially in the phase of disposal of the instrument. The PNF muscle sensory receptor exercises are one of the most important exercises that develop flexibility and physical strength and achieve the best muscular balance between the muscles. Flexibility at its best levels, as well as physical strength, and in order to achieve the best strength in order to achieve the best achievement, we must work to achieve a muscular balance between the muscles, hence the importance of PNF exercises.

Research importance:

The importance of the research is reflected in the preparation of PNF exercises in muscular balance in improving flexibility and balance of the muscles of the arms and achievement among players with the effectiveness of weightlifting.

Research problem:

Through the follow-up and field experience of the researcher being a former player in this field, he noticed that there is a noticeable decrease in the level of achievement in the weightlifting competition under (17 years), especially when comparing the recent results achieved in the Iraq Club Championship, where the recorded number reached (12.50 m) and the record number The Iraqi (13.40 m) with the world record of (23.34 m), we find that the difference is very large, which made the researcher research and study the causes of poor achievement, which he attributes to weakness in muscular strength and the lack of muscular balance between working muscles and corresponding muscles and lengthening Sufficient muscle mass to achieve the widest range of motion, and this came from the lack of interest in muscle balance exercises and achieving objective ratios when training the muscular strength of the working muscles and the corresponding muscles, and finding modern training methods to improve flexibility and balance the muscles of the arms and achievement of effectiveness, so the researcher turned to study this problem through Adopting a modern training method, which is the muscular sensory receptors (PNF) exercises, through which we seek to improve muscular strength and balance of strength in addition to achieving high levels of muscle strength and balance. For stability in the joint and improvement of positive flexibility, may you add or treat even a small thing from this decline in service of the sports movement in our dear country?

Research objective:

- Preparing exercises muscle sensory receptors (PNF) in improving flexibility, arm muscle balance and achievement among weightlifting athletes under 17 years old
- Identifying the effect of muscle sensory receptors (PNF) exercises in improving flexibility, arm muscle balance and achievement among weightlifting athletes under 17 years old.
- Identifying the superiority of the effect between exercises (control and experimental group) in improving flexibility, arm muscle balance and achievement among weight-pushing players under 17 years old.

Research hypotheses:

- Exercises muscular sensory receptors (PNF) have a positive effect in improving flexibility, arm muscle balance and achievement among weight-pushing players under 17 years old.
- The preference of the experimental group over the control group in affecting the improvement of flexibility, balance of the arm muscles and achievement among the weight-pushing players under 17 years old

Research fields:

- Human field: Diwaniyah Governorate Clubs
- Time field: (26/12/2021) to (7/3/2022)
- Spatial field: Al-Najma Center / Al-Diwaniyah Al-Sadr Al-Awal District / Faculty of Physical Education and Sports Sciences Stadium, University of Al-Qadisiyah.

Research methodology and field procedures:

Research Methodology:

The nature of the problem is what determines the appropriate approach adopted by the researcher to achieve the objectives of the research, so the researchers adopted the experimental method for its suitability to the nature of the problem to be solved. "The experimental method is the most accurate and efficient scientific research method in arriving at reliable results" **(**Hafeez and Mustafa. 2000) **,** the researchers chose to design the method of the two equivalent groups (experimental and control) with pre- and post-tests.

Community and sample research:

The researchers identified the research community as motivated by the effectiveness of pushing the weight under 17 years for the Al-Qadisiyah Governorate clubs, which numbered (eight clubs) who officially participated in the tournaments held by the Central Athletics Federation, which numbered (24), (4) players were excluded for the purpose of their participation in the pilot experiment, bringing the number of The research sample members (20) players, and they were divided into two groups, experimental and control, using a simple random method, by making a lottery.

Homogeneity and parity of the sample members:

For the purpose of ensuring the homogeneity and equivalence of the research sample, the researcher treated the tribal results of the sample members in (muscular balance of the arms, flexibility of the arms, achievement), through the use of the Levin test, which showed the homogeneity of the research sample and the (T) test and the equivalence of the two groups, according to the results shown in a table, (1) and (2).

Table (1) shows the homogeneity of the research sample members in the variables and measurements (length, mass, training age)

Variables	Measuring unit	Degrees of freedom between groups	Degrees of freedom within groups	Levene's value	Level sig	Type sig
Age	Year	1	14	3.923	0.063	Non sig
Mass	Kg	1	14	0.758	0.399	Non sig
training age	Year	1	14	0.434	0.521	Non sig
Length	Cm	1	14	1.635	0.222	Non sig

Table (2) shows the equivalence of the experimental and control groups in the skill tests

Variables	Experimental		Control		T value calculated	Level Sig	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Right arm muscle balance	70.67	4.16	68.41	4.89	1.115	.280	Non sig
Left arm muscle balance	69.22	5.70	69.20	5.70	.375	.712	Non sig
Flexibility	70.02	3.59	55.500	2.91	1.703	.106	Non sig
Achievement	9.69	.46	9.57	.54	.527	.605	Non sig

N1+N2=20-2=18 below the significance level (0.05)

Through what was presented in Table (1) and (2), the results show that the process of homogeneity and equivalence of the skills studied, where the results appeared that the level of significance of the Levin test for homogeneity were all greater than (0,05), and this indicates that the members of the research sample are homogeneous and that The level of significance of the test (T) was also greater than (0.05), this indicates that there are no significant differences between the two groups, which confirms the equivalence of the two groups (experimental and control).

The means, tools and devices used in the research

The researcher used the following means, devices and tools: Observation, personal interviews, to identify tests and measurement, measuring tape to measure length, dye material on the ground to determine the dimensions, dirt pitch to perform the event, dirt pitch to perform the event, legal medicine balls (kg3), video camera, laptop calculator, stopwatch number (3) .The scale of muscle strength and balance, electronic scale to measure the mass of the athlete, electronic stopwatch (3) red and white flags, Burke.

Field research procedures:

Determining the research variables and the tests used in the research:

After the researcher reviewed many scientific sources, both Arab and foreign, surveyed many theses and theses that dealt with research variables, experiments and field experience, and interviewed many experts and specialists in the field of athletics and the effectiveness of pushing weight, and made a special questionnaire to choose the appropriate tests with the topics and category of the research sample, the tests were determined which are Test (muscular balance of the arms, flexibility of the arms, achievement)

Characterization of the tests.

First: - To test the maximum strength of the arms: (Al-Dalawi. 2011)

- A test of the maximum strength of the muscles of the arms and the flexors
- The purpose of the test: To measure the maximum strength of the arm muscles, triceps and biceps.
- Necessary tools: a dynamometer with a graduated scale, iron wires and a short iron bar.
- Performance instructions: The player sits on the Keel Larry device and the dynamometer is installed on it, holding the grip of the Keel Larry device the other arm.
- Calculation of grades: Each laboratory is given two attempts to calculate the best results for it, as shown in Figure (1)

Figure (1) shows the measurement of the muscular balance of the arms

Second: Arm flexibility test: ( )

The gymnastic sticks standing test:

- The purpose of the test: To measure the flexibility of the arms.
- Tools: cylindrical gymnastics stick, diameter 2 cm and length 120 cm, measuring tape divided into centimeters.
- Test procedure: The tester stands holding the stick with the two fists from the middle so that the two fists are close together. The tester tries to raise the arms in front of the upper back and reach the stick behind the body as much as possible, provided that the elbows are not bent. The distance between the two fists is measured after the stick is fixed behind the body as shown in Figure (2).

Figure (2) shows the Arm flexibility test

Exploratory experience:

To confirm the steps of the scientific research and for the purpose of determining the accuracy and validity of the research work, the researcher conducted a reconnaissance experiment on a group of weight-pushing players from the research community and from outside the main sample in the Al-Qadisiyah Governorate Stadium, through which the test instructions were clarified, and the purpose of conducting the exploratory experiment is :

- Determining the difficulties and obstacles that will appear during the implementation of the tests and measurements.
- Knowing the appropriate time to take tests and measurements and how long the procedure takes.
- Identifying the ability of the sample members to carry out tests and measurements and their suitability for them.
- Identify the necessary devices and tools to be available and test their validity.
- Training of the auxiliary work team.

Pre-tests

Tribal tests for the research sample were conducted on 26/12/2021 on the playground of the College of Physical Education and Sports Sciences, University of Al-Qadisiyah.

Main experience:

The researcher prepared muscle sensory receptors (PNF) exercises, which were included in the training curriculum for weight lifters to develop the research variables. The training program included the inclusion of PNF exercises for the experimental group, based on the analysis and review of a large number of specialized scientific sources and references. The ageing stage and physical ability of the research sample, as well as taking into account the training of the sample members for the rest of the days of the week, the training goal is one for all members of the research sample, through coordination with the trainers and in order to control the experimental variable, and the exercises were characterized by the following:

- Implementing it in the special preparation stage.
- The exercises included in the training program continued for a period of (8 weeks), starting from Saturday 8/1/2022 to 2/3/2022.
- The number of training units during one week (2 training units) and thus
- The total number of training units for the prepared exercises was (16 training units).
- The days of the training units were: Saturday, and Wednesday.
- The time for performing the exercises in the main section of the training unit varied according to the objectives and requirements of each one.
- The intensity used in the implementation of the exercises ranged between (80% - 100%) of the maximum susceptibility of weight-bearers and in light of the tribal tests that were applied to the research sample.
- The researcher used the two methods of high-intensity interval training and repetition.

Post-tests:-

After completing the exercises prepared by the researcher and which were included in the training program, the researcher worked on re-applying the tests that were conducted pre-test in in the same place, College of Physical Education and Sports Sciences, University of Al-Qadisiyah and Al-Najma Center for Fitness, Body Building and Medical Rehabilitation on Monday 7/3/2022 And it continued until Thursday 10/3/2022 when all the data from the testers' scores and other measurements were recorded by the researcher and his assistant team.

Statistical methods: The search data was processed through the Statistical Package for the Social Sciences (SPSS).

Results and discussion:

Presenting the results of the differences between the pre-and post-test of the sending and receiving skills in soccer tennis and for the two research groups (experimental and control):

For the purpose of achieving the objective of the study, which included knowing the effect of PNF muscle sensory receptor exercises in improving flexibility, arm muscle balance and achievement among weight-pushing players under 17 years old.

For the members of the research sample, and for the purpose of describing the results of the sample members, the researcher processed the data obtained statistically by using (arithmetic mean, standard deviation) and for the purpose of knowing the significant differences between the pre-test and the post-test for both research groups and the (t) test for interrelated samples, as shown in Tables (3) and Table (4)

Table (3) shows the arithmetic mean, standard deviation, calculated t values, and a level of significance for the pre and post-tests and for the experimental group.

Variables	Pre-test		Post-test		T value calculated	Level Sig	Type Sig
	Arithmetic mean	Standard	Arithmetic mean	Standard			

		deviation		deviation			
Right arm muscle balance	70.8360	4.22869	89.5550	2.88789	20.623	.000	Sig
Left arm muscle balance	69.2260	5.70210	86.9030	1.90483	-8.633-	.001	Sig
Flexibility	55.5000 1.07497	2.91548	50.6000	1.07497	4.772	.000	Sig
Achievement	9.6900	.46536	10.3290	.39689	-4.818-	.004	Sig

N1 = 10 and significance level (0.05)

Table (4) shows the arithmetic mean, standard deviation, calculated t-values, and a level of significance for the pre- and post-tests and for the control group.

Variables	Pre-test		Post-test		T value calculated	Level Sig	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Right arm muscle balance	67.8200	4.56998	83.2660	1.52138	-13.330-	.000	Sig
Left arm muscle balance	69.7980	3.31084	82.3690	2.95809	-7.262-	.000	Sig
Flexibility	1.63639	57.3000	55.1000	1.72884	3.836	.004	Sig
Achievement	.35730	.51381	9.8900	9.6200	-3.104-	.013	Sig

N1 = 10 and significance level (0.05)

Discussing the results of the pre and post-tests for the two research groups in the skill tests:

Through the relevant results (3,4), it was found that there are significant differences between the tribal and remote tests of the tests (muscular balance of the arms, flexibility of the arms, achievement) in the effectiveness of pushing the weight for the experimental and control groups and in favor of the post-tests for both groups, and the researcher instructs the reason for the development in the Post-tests as a result of training with the PNF exercises that worked to develop the maximum strength of the muscles that were studied in where these exercises prepared in the training program worked and applied correctly and at specific times and methods used in these exercises to achieve these muscles the highest level of strength, as he sees " that among the benefits of PNF exercises is to increase strength and balance strength, in addition to achieving high degrees of stability in the joint."(Abdel-Dayem. 1993). "The researcher also sees that PNF flexibility exercises give a wider movement of the joint and thus give the muscle the best muscle output, and also remember the that PNF muscle lengthening exercises work to increase the range of motion, that is, increase the flexibility in the joint, and that this increase is a great benefit in increasing the amount of strength that We can get it " (Kathy. 2011) , The researcher also instructs the PNF muscle sensory receptor exercises, which had a clear role in improving flexibility for the players of the experimental group, since at the core of the work of stretching exercises is the development of flexibility in general muscle. This is confirmed by "It has become common practice to use the terms flexibility, stretching, range of motion, and joint mobility to describe the form of exercise that requires moving joints and muscles in a wide range."(Hafeez and Hassan Mustafa. 2000) The researcher also instructs that the development of the achievement in the effectiveness of pushing the weight is attributed to the effect of the selected exercises, as it worked to develop the achievement by affecting the muscular balance (Hani Abdel Aziz) "Stretching exercises have a clear effect on the achievement of field and field activities, as exercises of the PNF muscle sensory receptors have an effect on improving the muscle strength of the arm muscles through muscle lengthening through the development of the explosive power of the arm muscles, which leads to achieving the best achievement" (Al-Deeb. 2003).

Presenting the results of the differences in the post-tests in developing the skills under study:

In order to achieve the objective of the study, the researcher sought to extract the values of the arithmetic mean and standard deviation of the data of the experimental and control groups in the post-test and the use the independent equal-numbered (T) as a statistical method and to know the significance of the differences between the two groups by extracting the calculated (T) value, which showed the significance of the tests as shown in Table (5)

Table (5) shows the arithmetic mean, standard deviation, calculated t-values and a level of significance for the post-tests and for the experimental and control groups.

Variables	Pre-test		Post-test		T value calculated	Level Sig	Type Sig
	Arithmetic mean	Standard	Arithmetic mean	Standard			

		deviation		deviation			
Right arm muscle balance	89.5550	2.88789	83.2660	1.52138	5.254	0.01	Sig
Left arm muscle balance	86.9030	1.90483	82.3690	2.95809	3.687	0.005	Sig
Flexibility	50.6000	1.07497	55.1000	1.72884	6.708	0.000	Sig
Achievement	10.3290	.39689	9.8900	9.6200	3.668	0.005	Sig

N1=10, N2=10 and significance level (0.05)

Discussing the results of the post-tests of the two research groups in the skill tests:

Through the results presented in Table (5), it was found that there were significant differences between the experimental and control group in the post-tests (muscular balance of the arms, flexibility of the arms, achievement) in the effectiveness of pushing the weight in favor of the experimental group, and the researcher instructs these differences is the result of the effect of sensory receptors exercises The PNF muscle that worked to develop the outcome in the variables under study, as the researcher instructs the reason that training with PNF exercises gives the best muscle balance through the development of flexibility and balance of strength of the arms at the same time, "stresses that maintaining the muscles in a state of good balance by increasing the strength and range of motion of the joints and muscles, which leads to an increase in the flexibility of the muscles, which increases the production of the strength of the arms" (Abdel Aziz. 2010).

Where these exercises worked to bring about the highest degrees of muscular balance as well as developing flexibility of the arms and all these variables enter into the technical performance of the effectiveness of pushing the weight, as through its development the achievement develops and this is what we noticed in the dimensional results, This was confirmed “The training to develop muscular strength and focus on improving the balance of muscular strength between parts of the body, as it achieves the best use of energy, which leads to better kinetic performance with a better kinetic range by increasing the ability of muscles to contract for a faster rate of production capacity. Which enables the contestant to achieve the best in the effectiveness of pushing the weight” (Abdel-Dayem. 1993).

Conclusions and Recommendations:

Conclusions:

- There is a positive effect of exercises muscle sensory receptor PNF in improving flexibility, arm muscle balance and achievement among weight-pushing athletes.

Recommendations

- Emphasis on performing exercises muscle sensory receptors PNF due to their importance in improving flexibility and balance of the muscles of the arms and achievement.
- Conducting studies similar to this study for different age groups.

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