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The effect of exercises by neuromuscular facilities of sensory receptors style on strength endurance and scoring accuracy for young football players

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Abstract

The study problem came by looking for modern training methods to develop scoring weakness of young football players in addition to the weakness of physical abilities, the most important of which is the endurance of strength, which affects the accuracy of scoring throughout the time of training and the match, and this ability is one of the important elements to success performance of young football players, and since the researcher is one of the followers of the Karbala football clubs championships for the youth category and through being a coach for this category and for many years, I noticed the weakness during the performance in the matches, especially when implementing the scoring skill, but the other side that prompted the researcher to delve into this problem is the lack of research by some coaches on modern methods to develop their physical, skill and technical abilities and thus develop performance and achieve good results for their teams that they train, Among these methods is the method of neuromuscular facilities of sensory receptors, which improves motor and sensory efficiency by taking advantage of the reflex actions resulting from prolongation and the occurrence of reflex actions, which come through mechanical sensors located in the joints and the end of the muscles (Muscular spindles, Kolgi tendon organs), which play a major role in the players' ability to control and coordinate in various body movements, Thus, achieving good performance, through which the desired results can be achieved, and thus the researcher resorted to preparing exercises in the manner of neuromuscular facilities for sensory receptors on some players in Karbala clubs, which numbered 6 participating in league, where sample was divided into 2 groups (Experimental, control) by (10) players for each, The aim is to identify effect of exercise on variables, The researcher assumes that exercises prepared affected on strength endurance and scoring accuracy by applying the exercises for (8) weeks, (3) training sessions a week, the post-tests conducted to collect results, the exercises proved an impact on sample according to the results.

Keywords: Neural facilities of sensory receptors, scoring accuracy, football

Introduction

Football is most important sports that have received continuous and increasing attention and for all age groups, This is what makes specialists, coaches and researchers, looking for the development of this game by searching for different training methods and methods that will help players develop their various physical and skill abilities by focusing on exercises in the manner of neural facilities for sensory receptors, which the researcher considers the auxiliary or basic factor that contributes to the development of various abilities, whether physical or skill abilities, which are necessary for all games, whether these games are individual or teams, And the fact that the game of football is one of the games that is characterized by a high pace of physical performance and skill and for long periods of time, so it is necessary to search for training methods that develop physical capabilities, including the ability to withstand strength and accuracy of skill performance and the ultimate goal for all team members, which is the accuracy of scoring and winning, and despite the search for methods that contribute to the development of capabilities and skills for young football players by researchers and specialists, However, there is a fluctuation in the physical and skill level of the youth category, and thus it is necessary to use modern and diverse training methods and integrate sports sciences with each other and take advantage of the great possibilities provided by modern technology in order to keep pace with and keep pace with the development in the teams and clubs of Europe and some teams of Asia and the Gulf, and

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target score is very dominate skill for players and for all age groups, Being the final fruit obtained by the team and is the final product of all the physical, motor, skill, tactical and mental efforts provided by the players to achieve the desired goals.

Through the importance of scoring skill and strength endurance and their impact on the results of matches, the researcher resorted to using a training method, which is the neural facilities of sensory receptors, which works to stimulate the neuromuscular system through the implementation of muscle lengths and contractions aimed at pressing on the mechanical sensors in the tendons and joints, which work to curb the reflex actions to help the muscles work more efficiently and help increase coordination, muscle compatibility and joint flexibility. Through the lack of resistance and increased range of motion when lengthening the muscles, which in turn contributes to develop target score accuracy of young football players.

Through what has been mentioned and the nature of the performance of the scoring skill, which needs different situations and movements throughout the period of the match or training, the importance of studying to develop this skill comes as well as the link between the ability to withstand the force and scoring because the various scoring operations need strength and given the long time of the football match needs to endure the force, it contributes for good results achievement, as well as some coaches benefit from this method to develop the level of their players in these abilities.

Study problem

Despite the development in the sports levels of the game of football represented by the physical, skill and tactical aspects, but at the same time there are aspects in which the level fluctuates for some skills and abilities, and this is what the researcher notes in many exercises and matches for the game of football for the youth category, where we notice the waste of many opportunities to score by many players, whether they are young players or advanced, and there may be multiple reasons for this problem, including what is related to The skill and technical side of the player, and another is related to the physical aspect of strength, speed and endurance, in addition to the psychological and mental aspects that affect the accuracy of scoring, The researcher believes that flexibility and motor ranges of joints are a major and important factor in the development of scoring accuracy, so the researcher resorted to preparing exercises in the manner of neuromuscular facilities for sensory receptors, which works to develop the ability to withstand the strength that players need throughout the time of the match, as well as exercises help the ability of young players to score from different situations by range increase of joints and muscles.

Study objectives

1. Preparing exercises in the manner of neuromuscular facilities for the sensory receptors of the research sample.

2. Identify the effect of exercises in developing strength endurance and scoring accuracy for the research sample.

Study hypotheses

Exercises in the manner of neuromuscular facilities of sensory receptors impact on endurance of strength and scoring accuracy of young football player's research sample.

Study areas

1. **Human field:** Karbala clubs players for the sports season 2023-2024.
2. **Time range:** The period between 30/12/2023 to 3/2/2024.
3. **Spatial field:** Al-Jarrah Stadium and Al-Khairat Stadium in Karbala Governorate.

Study terms

1 - neuromuscular facilities of sensory receptors: It is defined by (Taher Rami, 2016, 201) ^[3] as a series of contractions and relaxations in certain groups of muscles whose idea depends on tightening, relaxing and then tightening deeper, which works to support and increase neuromuscular signals by stimulating sensory receptors in joints and muscles for the purpose of exploiting untapped energy.

Methodology

The researcher adopted experimental method of equivalent groups (Experimental and control) by pre-post-tests due to appropriate method to solve the research problem.

Study sample

The community of research was identified, namely football players in the clubs of Karbala for the youth category for the sports season (2023_2024), which numbered (6) clubs, where some clubs were excluded due to the lack of official holidays and the non-participation of some clubs in the tournament, and Al-Khairat Club and the number of its players (20) players were represented a research sample in randomly manner and experimental control of the sample was conducted, and the sample was divided (10) players of two groups (Control and experimental) in a simple way and in draw method.

Study procedures

Study sample homogeneity

Variables were identified to be studied of research variables, which were represented by (height, mass, chronological and training age), which may affect the studied research variables, where homogeneity conducted by using the Levine test among the members of groups in measurements, in order to adjust research variables that affect the sample of experiment, Table (1) shows homogeneity.

Table 1: Shows homogeneity

Variables	Measurement unit	Levine test value	Freedom degree	Sig. level	Sig. type
Height	cm.	.251	18	.546	Insig.
Training age	Month	.139	18	.431	Insig.
Mass	Kg.	2.236	18	.098	Insig.
Chronological age	Month	.145	18	.678	Insig.

Through Table (1), we note value of significant the variables that may affect on experiment and all of them were greater than (0.05) and thus make sure homogeneity of the variances was equal to total sample, meaning data are homogeneous.

Variables identification

Through researcher's knowledge in addition to review of scientific sources of football, through the research problem, which is weakness of scoring for the research sample as well as the weakness in the ability to withstand the force in addition to impact of independent variables researched the scoring skill and strength endurance was determined.

Study tests description

1. Football scoring test (Mushtaq Salal, 2023, 52) ^[1]

Test objective: Measuring the accuracy of aiming towards the goal - Tools used: a tape to set the scoring area. Football field. Football balls number (5) - Method of performance: (5) balls are placed on the penalty line, which is 18 yards away from the goal line and the distance between one ball and another (1) yards, where the player scores in the areas indicated by the test and according to its importance and difficulty and sequentially ball after the other to be tested from the running position - Scoring method: The number of injuries that enter the goals set from both sides is calculated so that the scores of each of the five balls are calculated as follows: Each ball is calculated with the points specified for the calculated area, taking into account that if the ball touches the bar, it is calculated for the highest area

according to the numbered areas, and zero when it goes out outside the goal boundaries".

2. Strength endurance test (Mushtaq Salal, 2023, 54) ^[1]

- **Test name:** Vertical jump from a squatting position and (Full bending of the knees) for (30) seconds.
- **Objective of the test:** To measure the strength tolerance of the muscles of the legs.
- **Used Tools:** Stopwatch, whistle.
- **Performance description:** When starting and from a squatting position, the laboratory is high so that the knees are stretched and the feet leave the ground in each jump and the player continues to jump for (30) seconds, as in Figure (4) below.
- **Test instructions:** Jumping up with arms extended at abdominal level, with the knees fully bent in a squatting position and given an attempt to each tester.
- **Recording method:** The number of jumps is recorded for the laboratory within (30) seconds.

Pre-test

Researcher conducted pre-test for selected sample on Wednesday, 1/5/2024 at Khairat Stadium in Al-Khairat district.

Equivalence

To starting from one point of initiation for research groups, researcher resorted to finding equivalence in variables of strength endurance and scoring accuracy for the experimental and control research samples, through grades of pre-test and application of statistical test (T test) for independent variables, as in Table (2).

Table 2: Shows equivalence of control and experimental groups and for all research variables

No.	Variables	Measurement unit	Control group		Experimental group		Calculated (t) value	Sig. level	Sig. type
			M.	ST.D	M.	ST.D			
1.	Scoring	Degree	9.70	2.21	10.50	3.30	0.63	0.53	Random
2.	Strength endurance	Rep.	22.60	1.42	22.70	1.63	0.14	0.88	Random

According to Table (2) value of significant and the two variables are greater of (0.05) to accept the nihilistic hypothesis, which states there are no differences among degrees of two groups and that the differences are highly significant, this confirms equivalence of research groups in variables surveyed.

Application of neuromuscular facilities of sensory receptors to experimental sample

1. Applying research exercises lasts (7) weeks.
2. (3) Sessions per wee.
3. Total of (21) training sessions.
4. (24-32) minutes for each training session.
5. (3-5) exercises for each training session.
6. The training started on 2/5/2024 on Thursday in different parts of main training session section.
7. Intensity of training was 90% to maximum player performance.

8. The researcher used the method of repetitive training in the application of exercises

Post-test

After completing exercises application on experimental research sample, resorted to conduct post-tests for research samples on Friday (21/7/2024) at exactly (six in the afternoon) in Al-Khairat stadium with possibility of providing same conditions were in pre-test, as much as possible while depending on same sequence of procedures researcher relied on in pre-tests.

Study results

Presentation and analysis of (pre-post) test of experimental group: For purpose of knowing results of differences between pre and post-tests for research variables and for experimental group, researcher used (t) test for samples, as table (3) shows.

Table 3: Shows pre-post-tests of experimental group

No.	Variables	Measurement unit	Pre-test		Post-test		Calculated (t) value	Sig. level	Sig. type
			M.	St.D	M.	St.D			
1.	Scoring	Degree	22.70	1.63	24.80	1.13	5.54	0.00	Random
2.	Strength endurance	Rep.	10.50	3.30	12.90	3.31	4.81	0.01	Random

Through Table (3) we note statistical values of results of pre- and post-tests for research variables and experimental group proved existence of differences and were significant between two tests and in favor of post-test of experimental group and what proves this is value of (Sig.) clear in Table (3), where it was less than level of significance (0.05) and thus make sure that there are significant differences between scores of pre- and post-tests and in favor of post-test.

Table 4: Significance of differences between pre-test and post-test in control group for research variables

No.	Variables	Measurement unit	Pre-test		Post-test		Calculated (t) value	Sig. level	Sig. type
			M.	St.d	M.	St.d			
1.	Scoring	Degree	22.60	1.42	23.50	1.08	2.37	0.04	Random
2.	Strength endurance	Rep.	9.70	2.21	9.50	2.06	0.39	0.70	Random

Through Table (4) we note statistical indicators of pre- and post-tests results of control group variables, where results indicated significant differences between pre- and post-tests and in favor of post-for variables (Strength endurance) and what confirms this is value of (sig) shown in Table (4), where it was less than level of significance (0.05) and thus accept alternative hypothesis, which states that there is a difference between scores of pre- and post-tests and in favor

Presentation and analysis of the (pre-post) tests of the control group

For purpose of testing hypothesis of research, researcher analyzed pre and post-data using test (t) for correlated samples and table (4) shows significance of differences between pre- and post-tests of control group in two research variables.

of post-As for variable (Scoring) there were no significant differences between pre- and post-tests, what confirms value of (Sig) shown in table (4), where it was greater than significance level (0.05).

Presentation and analysis of the experimental and control group (post) tests

Table 5: Shows mean, standard deviations, calculated value (t) and significance level between post-tests of control and experimental groups

No.	Variables	Measurement unit	Control group		Experimental group		Calculated (t) value	Sig. level	Sig. type
			M.	St.d	M.	St.d			
1	Scoring	Degree	23.50	1.08	24.80	1.13	2.62	0.01	Sig.
2	Strength endurance	Rep.	9.50	2.06	12.90	3.31	2.75	0.01	Sig.

From Table (5) we note statistical indicators of post-tests results for two research groups variables, results indicated differences between two tests and in favor of experimental group and what proves this is value of (sig) shown in table (5), where it came less than (0.05) significance level, thus accept alternative hypothesis, which confirms existence of differences between degrees of two post-tests in favor of experimental group.

Results and Discussion

Through what has been presented of data in table (3) proved results in existence of statistically significant differences in pre- and post-tests and in favor of post-tests of experimental group, this confirms imposition of research an effect of exercises applied to research sample, on variables strength endurance and scoring, that effect was positive and confirm results of research sample test, there are significant differences between two research groups in favor of experimental group.

To clarify more with regard to two research variables, namely strength endurance and scoring, researcher attributes exercises of neuromuscular facilities of sensory receptors performed during training sessions work to develop these variables, as indicates (Saad Hammad Al-Jumaili, 2014, 38) [4] that "exercises of nerve facilities work to increase strength endurance and flexibility of joints and body muscles, which helps to increase balance and thus ability to score from different positions throughout match". Researcher believes that exercises of nerve facilities work to increase joints range of motion, ie increase ability of muscles to stretch and thus produce more force than that in muscles less rubber, and this was reflected in development of two research variables, namely strength endurance and scoring. What confirms above statement indicates (Rami

Mohammed Al-TaHER 2016, 203) [3] that "training exercises neuromuscular facilities of sensory receptors help increase nerve signals of muscles working in skill or sports activity chosen because exercises are very similar mechanically and anatomically with different sports skills, and one of advantages of these exercises is development of many abilities and physical qualities, most important of which are (Strength, strength endurance, flexibility, compatibility and balance)". All these abilities and qualities contribute significantly to success of scoring process during matches and training, as well as is one of necessary factors for all sports activities and events, "this type of exercise imposes high pressure on ligaments and tendons of players because of nature of performance, because technical performance of exercises applied in research must be as maximum as player can perform". Therefore, it is necessary to be careful when applying these exercises, especially with young age groups, training form of exercises is determined by work of extending target muscles to maximum extent possible for a period of 10 s, followed by relaxation for 3s, after which we work to extend the muscles with the help of external colleague light pressure gradually increasing. He points out in this regard (Ali Abdel Amir, 2014) [5] that the exercises used in the research are one of the methods of decentralized prolongation and is one of the important methods in improving many physical and skill abilities that have a significant impact on the performance of specialized skills that need to produce balanced muscle strength throughout the period of performance of various sports activities during play and training.

For control group and through data in Table (4) proved differences between pre- and post-test in favor of post-test for (Strength endurance), "That development to commitment and continuity of control group members in performance of

training sessions given by their trainer because continuation of training works improve physical variables even if that training is not organized and not codified tightly. Despite improvement of control group". compared to experimental group is less, variable (Scoring) were no differences between pre- and post-tests of control group and researcher attributes lack of development to the lack of use of exercises facilities neuromuscular sensory receptors in research because it was only difference between experimental and control groups.

In post-tests of two groups, and through presented and watched from data results in table (5) proved existence of differences between two groups in favor of experimental group of two variables surveyed, the results obtained by researcher indicated existence of an effect of exercises facilities neuromuscular sensory receptors on experimental research sample in research variables withstand strength and scoring, Which achieves our research goal and confirms (Jamal Sabri Farag, 2019, 98) ^[2] "Before applying this type of exercise, players must warm up well because these exercises work as a high challenge for members of tendon colgi located in joints and muscle spindles located along muscle fibers, they work together and monitor tension of muscle fibers and tendons during performance, and thus these sensors work to send nerve signals to spinal cord, thus increase mechanical reflexes of contraction and thus allow joints with high rates of movement". "Exercises have benefits from multiple aspects, first side, which concerns players and development of their physical and skill level, which relates to variables surveyed, while other side, which is related to increasing kinetic ranges of players' joints, which helped in not exposing players to injuries because physical and skill performances need quick and sudden movements during matches and training, and this makes them vulnerable to some types of sports injuries". Since researcher studied strength endurance and scoring for young football players and the fact that time of football match is a long time, so football players need to endure strength throughout match time, whether with or without ball, exercises used help improve strength endurance and this is confirmed by research results, as for scoring, exercises helped nerve facilities players in increasing flexibility of joints and range of motion and increasing neuromuscular compatibility, "which is one of basic elements of scoring process, which requires perform sudden and quick movements to get rid of competitor and success of scoring process because it is the final product that all training operations aspire".

Conclusion and recommendations

Conclusion

1. Neuromuscular receptor facilitation exercises helped players increase neuromuscular coordination, which contributed to improving scoring accuracy.
2. The exercises used produced players capable of producing high muscle strength ranges for the duration of the match.
3. Exercises contributed to neuromuscular facilities of sensory receptors to prevent players from being exposed to injuries by increasing joints flexibility and range of motion.

Recommendations

1. Conducting studies dealing with exercises for neuromuscular facilities of sensory receptors and applying them to other samples.
2. Trainers have to attention to include their sessions with exercises of neuromuscular facilities of sensory receptors because of their impact on development of muscular strength and scoring.
3. Developing exercises to improve most important skills of young football players, which is scoring skill.

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