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PREVENTIVE EXERCISES TO STRENGTHEN THE ANKLE JOINT AND ASSOCIATED WITH SOME RECOVERY METHODS AND THEIR EFFECT ON SOME PHYSIOLOGICAL AND PHYSICAL VARIABLES FOR YOUNG FOOTBALL PLAYERS

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Abstract

The research aims to identify the effect of preventive exercises in preventing ankle joint injury for young soccer players. And to identify the effect of exercises accompanying some means of recovery on some physical and functional variables of the research sample. A sample of youth football players was selected from Al Shula Sports Club. The researchers used the experimental method in one group design (pre-post) due to its suitability to the nature of the research. Pre-tests were conducted on the sample, then the researchers started the main experiment, and the recovery exercises used on the muscles (neck - arm - torso - leg) and some recovery methods were prepared with cold baths and local massage, as well as a group of exercises that work to strengthen the muscles working on the ankle joint and during Eight weeks (24) preventive hospital units, three days a week, and after completing them, post-tests were conducted and data were entered into the statistical bag to come up with the following conclusions: A clear improvement in the range of motion tests of the ankle joint, and this indicates the effectiveness of preventive exercises. There were no significant differences between the pre and post tests in the two heart rate tests before exertion and the maximum oxygen consumption. A clear improvement in the heart rate test after exertion in the research sample. The appearance of an improvement in the physical tests of the research sample, and this indicates that the preventive and remedial exercises had a clear effect.

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Keywords: preventive exercises, recovery methods, ankle joint.

Introduction to the research and its importance:

The game of football is distinguished by its many diverse defensive and offensive motor skills, and it depends on what the player possesses in terms of physical and motor capabilities, and the skill and planning capabilities focus on it, as the football player must be able to move quickly, follow-up and change direction during defensive and offensive performance, and for the success of this it must be The physical rules are effective, especially for the main muscles responsible for performance and other muscles supporting, auxiliary, stabilizing and rotating muscles of the joint, and here it is necessary to understand the principles of the movement of the motor system of the muscles of the body in general and to know the joint muscles during the specialized motor performance and thus work in a scientific way to develop muscle strength as well as strengthening its ligaments and tendons To reduce the incidence of injury, especially the most common injuries in football, which is the ankle injury (muscles - tendons - ligaments) resulting from the high effort of defensive and offensive movement.

The development of the player's level depends on the level of his functional and physical capabilities and on the extent of his response to the means of recovery and exercises used after the end of training in order to achieve adaptation of the various body systems and enable the football player to perform at the highest possible level, as recovery helps to improve response and accelerate the process of re-energizing the different organs of The body, in addition to getting rid of fatigue and exhaustion resulting from competitions or training, or renewing indicators of the physical and functional condition of young players, as recovery is the main method used by the coach to influence the athlete in order to raise the level of performance and sporting achievements.

The prevention of physical injuries is one of the most important matters for therapeutic physical education in modern sports medicine, as the preservation of the athlete and the endeavor and research to reduce the percentage of injury and its occurrence to a minimum and the prevention of injuries are among the important matters in the training process, and prevention is special procedures used during competitions and training To reduce or prevent injury.

Recovery is as important as the training load, as trainers in developed countries use advanced recovery methods, where recovery is at specific times, volumes,

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and repetitions appropriate to the training curriculum, in addition to the use of special recovery methods. The new direction for developing the effectiveness of sports training for the purpose of achieving and developing a high level of sports achievement has become dependent and closely linked to the implementation of a high training load with the use of recovery programs by its various means, appropriate to the training curriculum and its objectives, and to raise the physical and functional aspects of the players (Hashem Adnan: 15: 2001: 113) . As well as using ankle injury prevention exercises before and during the recovery phase. The importance of the research lies in the fact that some studies dealt only with how to prevent ankle injuries, such as the study of Imad Khalif Jaber Al-Asmi (Imad Khalif: 2015: 11) and the study of Faryal Sami Khalil (Feryal Sami: 2019: 13), and some of them dealt with the effect of means of recovery, such as the study of Adel Abdel Hamid Ali Al-Fadhi (Adel: 2016: 7) and the study of Ali Hussein Muhammad Ashkanani (Ali: 2019: 10). While the current study dealt with the link between preventive exercises and means of recovery, and according to the knowledge of the researchers, this study did not address it so far.

Research problem:

Injury prevention is a component of safety and health for players, which aims to improve their health by preventing injuries. And that some injuries that occur in sports activities lead to a threat to the life of the athlete in some cases or lead to him leaving the sport in other cases or it becomes a chronic injury and one of the injuries that football players suffer from is the ankle injury because it depends on this joint in Most of the play moves by a large percentage.

As a result of the nature and requirements of the event, which includes different physical and skill movements, as well as direct contact between the players, and as a result, the possibility of various injuries increases. The basis of this problem was found that the majority of injuries are mainly injuries in the early stages of the player's training life (for the youth stage), which were not subject to a proper preventive approach. Therefore, it was found necessary to develop a preventive program using physical exercises for the purpose of preventing this injury. In addition to the use of remedial exercises at the end of the training unit, which will reduce these injuries significantly, and remedial methods that help the athlete in developing and raising the physical and functional aspect and continuing training in the field of football.

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- research aims:

- To identify the effect of preventive exercises associated with some hospital methods in preventing ankle joint injury among the research sample.
- To identify the effect of preventive exercises associated with some means of recovery on some variables The physical and functional aspects of the research sample.

- research hypothesis:

- There are statistically significant differences between the pre and post tests of the research group in the range of motion of the ankle joint.
- There are statistically significant differences between the pre and post tests of the research group in some physical and functional abilities of exercises and hospital aids.

- Research areas

- The human field: a sample of youth football players in Al-Shoula Sports Club.
- Temporal field: the period from 1/25/2022 to 6/21/2022
- Spatial field: Al-Shula Sports Club / Al-Shula - Baghdad Governorate.

- Research Methodology:

The researchers used the experimental method in one group design (pre-post) due to its suitability to the nature of the research.

The research community and its sample:

The research community was chosen by the intentional method, and they numbered (35) soccer players in the sports season (2021-2022), as their ages ranged between (17-18 years), and they were the players of Al-Shoula Sports Club. The number of the sample was (20 players) who adhered to the procedures The field experiment, as for the rest, some of them had injuries, and others did not adhere to the experiment, so the researcher excluded (15) players from them. Thus, the percentage formed by the sample relative to the research community was (57.142%). The sample is homogeneous as they are first-class youth club players.

- Devices and tools used in the research:

Goinometer (to measure flexibility), dynamometer (to measure strength), oximeter (to measure heart rate), elastic ropes, tape measure (to measure

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length), adhesive (to fix the goinometer to the player's fixed leg), balance (to measure weight), stopwatch (made in China).

- Field procedures:

Medical diagnosis: The researcher presented the research sample to a doctor specialized in the field of sports medicine and rehabilitation of injuries, Dr. Badran Abdel-Razzaq, a consultant physician in sports medicine, Ministry of Youth and Sports, and a clinical examination was conducted to show that the players (the research sample) did not suffer any ankle injury, and that the sample was ready To apply preventive exercises and recovery methods.

- Tests used in the research:

Measurements of the angles of the range of motion of the ankle joint:

1- Measurement of the plantar and dorsal flexion angles of the ankle joint: (Peggy: 2012: 11: 361)

- Functional tests:

1- Measuring the pulse at rest and at the time of exertion. (Muhammad Nasreddin: 2013: 14: 84)

2- Measuring the maximum oxygen consumption VO2max (Mohammed Nasreddin: 2013: 14: 298)

- Physical exams:

Strength Tests: (Farqad Atta: 2005: 12: 53)

a. Back flexion strength test:

B. Toe flexion strength test:

c. Speed endurance test. (Ahmed Fakher: 1996: 2: 227)

Dr. A test of strength characterized by speed (Abdul Razzaq: 1999: 8: 64-66)

Exploratory experiment: The researchers conducted an exploratory experiment for the devices and tests used, as well as to find out the validity of the exercises used, and it was conducted on a group of (5) young players from the same research community and outside the main sample, and this was done on Tuesday 1/25/2022 at 4 pm, to find out The validity of the devices and tests used in the experiment.

- Pre-tests

pre tests and measurements were conducted for the research sample on Friday and Saturday corresponding to 1/28/2022 - 1/29/2022 at 4:00 pm. The physical tests began, then on the second day the functional tests.

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- The main experience:

After conducting the pre-tests, the researchers started the main experiment on Monday, corresponding to 1/31/2022, and the recovery exercises used on the muscles (neck - arm - torso - leg) were prepared, as well as a group of exercises that work to strengthen the muscles working on the ankle joint, and the range of motion Using a variety of means such as: (weights - rubber ropes - water exercises). And work as follows:

1- The time of the training unit consisted of 120 minutes, and the work of the researchers' program included only the concluding section using exercises, which lasted 10 minutes, in addition to the means of recovery (local manual massage - cold baths) and lasted 15 minutes after the training unit.

2- The number of hospital units used is three units per week, and thus the number of total exercises during eight weeks is (24) hospital units, as well as for preventive exercises for the ankle joint.

3- The concluding section included (flexibility and relaxation exercises) and was divided as follows:

- Neck flexibility exercises (3), arm flexibility exercises (2), torso flexibility exercises (5), and leg flexibility exercises (8.(

-4As for the preventive exercises, the work was as follows:

-The time of the preventive unit: (16 - 30) minutes.

Gradual repetitions: (4-8) repetitions. Rest between repetitions: (20-40) seconds.

-Number of groups: (2 - 3) groups. Rest between sets: (40-80) seconds.

Gradient of exercises: from easy to difficult.

- Post-tests: The post-tests for the research sample were conducted on Thursday and Friday, corresponding to 3/31/2022 and 4/1/2022, under the same conditions as the pre-tests.

- Statistical means:

The researcher used the statistical package SPSS version 26 to process the appropriate statistical methods for the research.

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- Presentation, analysis and discussion of the results:

- Presentation and discussion of the results of the pre-posttests of the research variables as follows:

Table (1)/ the results of the pre-post tests in the variable range of motion of the ankle joint of the research sample

Variables	Measure-ment	pretest		post test		Calculated T	Statistical significance	Moral Connotation
		M	S	M	S			
Dorsal flexion of the foot	Degree	91.00	4.948	105.00	5.109	17.330	0.000	Moral
Plantar flexion of the foot	Degree	42.00	4.984	58.60	5.679	19.737	0.000	Moral

Below the level of significance ≤ (0.05) and degrees of freedom (n-1=19)

From the above table, we find that the value of (sig) is smaller and equal to the value of the significance level (0.05), which indicates the presence of significant differences in favor of the post-test in the range of motion test of the ankle joint, and the researchers attribute this development to the fact that the prevention program for the ankle joint has helped to increase flexibility The tendons and ligaments, as well as the muscles associated with them, improve the range of motion of the dorsal and plantar flexion of the ankle joint due to the preventive exercises that work to "stimulate the defense mechanism of the body's systems and accelerate the completion of compensations and improve metabolism and developmental functions and regeneration of various functions, and it also limits the resulting effect due to lack of Motor activity" (Sami'a Khalil: 2000: 6: 21). In addition, the preventive exercises of the research group had a major role in reducing motor limitation, that is, they helped to develop the range of motion in the dorsal and plantar flexion of the ankle joint.

Table (2)/ results of the pre and post tests in the functional variables of the research group

Variables	Measure-ment	pretest		post test		Calculated T	Statistical significance	Moral Connotation
		M	S	M	S			
Resting heart rate	beats/minute	71.00	2.469	70.40	1.429	0.776	0.448	non-moral

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heart rate after exertion	beats/minute	117.700	5.292	124.400	3.405	3.366	0.003	Moral
maximum oxygen consumption VO_{2max}	millimeters of mercury	95.2	11.43	110.6	7.53	3.107	0.036	Moral

Below the level of significance ≤ (0.05) and degrees of freedom (n-1=19)

From Table (2), we find that there are significant differences in the heart rate after effort and the maximum oxygen consumption, while no significant differences appeared in the resting heart rate test, and the researchers attribute this to the fact that athletes in general have a large heart size, especially football players because their work system is a mixed system and therefore no significant differences appeared between the two groups. While during physical effort, the number of heartbeats accelerates significantly if the level of training is not good or the recovery periods are insufficient. The heart rate is related to the level of physical fitness as well. The functional and healthy state of the internal organs of the body, as the low heart rate in athletes is an economic condition for the work of the heart, and it has high health importance, as (Bahaa El-Din: 2000: 5: 58) indicates that when training begins, the pulse increases directly, and this is related to The percentage of the increase in the intensity of training, and the intensity of training is inferred by the rate of oxygen consumption. The higher the rate of oxygen consumption, the higher the heart rate, and the heart rate increases with the increase in the intensity of training.

And when the training ends, the heart rate does not return directly to the normal state, but it returns gradually and takes some time to reach its rate during rest. (Bahaa El-Din: 2000: 5: 52)

Abu El-Ela (2000) stated that sports activity is one of the reasons for the increase in the size of the heart muscle, and that the changes that occur are natural physiological changes resulting from the adaptation processes associated with sports training (Abu El-Ela: 2000: 4: 399). And that sports training leads to an increase in the size of the heart muscle and thus an increase in its efficiency, and he indicated that training has a clear effect on the heart rate during rest, as this rate decreases in the trained individual with the link to his training condition. (Mathews: 1976: 17: 266)

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Table (3)/ the results of the pre-post tests in the physical variables of the research group

Variables	Measure-ment	Pre-test		post test		Calculated T	Statistical significance	Moral Connotation
		M	S	M	S			
dorsiflexion strength	Degree	12.20	1.196	16.60	3.470	7.443	0.000	non-moral
Toe flexion strength	Degree	12.60	1.872	22.00	3.893	7.710	0.000	Moral
carry speed	second	33.6	2.03	33.1	2.14	5.230	0.004	Moral
Distinctive strength with speed	cm	5.503	0.434	4.936	0.266	5.781	0.012	Moral

Below the level of significance ≤ (0.05) and degrees of freedom (n-1=19)

From Table (3), we find that the significant differences for all tests are significant and in favor of the post-test, and the researchers attribute this to the preventive exercises used as well as the recovery exercises that helped in improving the level of the research group, and that the weight exercises used, water exercises, rubber ropes and body weight, which are designed according to the image Gradual strength has affected the protection of the player's ankle, and most of the activities practiced by the athlete have a positive effect in raising the muscular strength of the legs, and thus affect in one way or another the strength of the tendons and ligaments, and this has positively affected the appearance of morale in the two tests of the strength of the legs, as well as the endurance of what is contained in the preventive program, as well Recovering from exercises helped improve the level of the players, and this result is consistent with what he said (Khater Walbek: 1:170: 1978): “The training program for any activity has a positive effect on the muscular strength of the two men.”

The result reached by the researchers also agrees with what was indicated by (Abdulaziz Ahmed Al-Nimr: 2001: 9: 172): “Training with weights or any form of resistance is one of the methods of preparing and preparing the player using various progressive resistances to increase the ability to produce strength or Confronting it, and it includes performing exercises with weights in an attempt

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to make the individual stronger, more capable and effective, and to increase muscle size and improve motor performance as well as changes in body components, and this is not required to be done using maximum or less than maximum resistances. Also, the organization and planning of exercises on a regular basis, and the gradation in giving and increasing the difficulty of exercises has helped in the improvement of the players, and this result is consistent with the opinion of (Osama Ahmed: 1999: 3: 64) from: The use of intensity had a clear effect on the development of muscle strength."

- Conclusions and recommendations:

- Conclusions:

1- A clear improvement in the range of motion tests of the ankle joint, which indicates the effectiveness of preventive exercises.

2- There were no significant differences between the pre and post tests in the heart rate tests before exertion and the maximum oxygen consumption.

3- A clear improvement in the heart rate test after exertion in the research sample.

4- The appearance of an improvement in the physical tests of the research sample, and this indicates that the preventive and hospital exercises had a clear effect.

- Recommendations:

1- Giving various exercises after the training unit, in addition to the means of recovery after training, so that the player takes a period of rest, after which the stage of returning the player to what he was before training begins.

2- The need to use hospital aids in the field of sports training, as failure to use them properly leads to a disruption of the training process and the athlete's access to a state of excessive training, which leads to a decrease in achievement at the end or injury.

3- Adoption of the preventive program in training football players by the competent authorities in this field.

4- The need for coaches of football teams to be familiar with the use of preventive programs in order to benefit from them in preparing players and avoiding them injuries in the stages of training and various official matche.

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