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**Dr. Mostafa Ibrahim
Abdelkareem**

Lecture, General Directorate of
Physical Education and School
Activity/Ministry of Education,
Iraq

The effect of rehabilitation exercises using weights (kettle ball) in rehabilitating shoulder dislocation injuries for handball players in the clubs of Najaf Governorate

Dr. Mostafa Ibrahim Abdelkareem

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Abstract

The purpose of this paper is to preparing rehabilitation exercises using weights (kettle ball) to rehabilitate partial tear injury of the shoulder muscle in handball players of Najaf Governorate clubs, and identifying the effect of rehabilitation exercises using weights (kettle ball) to rehabilitate partial tear injury of the shoulder muscle in handball players of Najaf Governorate clubs. The researcher adopted the experimental approach with a single-group design with two tests (pre- and post-tests) to suit the nature of the research problem. The research community was represented by handball players for the clubs of Najaf Governorate, which were (Najaf Club, Kufa Club, Naft Al-Wassat Club) for the 2023-2024 sports season, and their number was (11) injured players. As for the sample, it was players with partial dislocation of the shoulder joint. By conducting the examination and medical diagnosis, the type of injury was determined. The research sample was determined and included (8) injured players, as they were chosen intentionally and through the clinical examination of the attending physician, as the type of injury was partial dislocation of the shoulder. One of the most important results reached by the researcher is that: The use of rehabilitation exercises using weights (kettle ball) has shown a positive effect in improving the range of motion of the shoulder joint in handball players, and the exercises prepared using weights (kettle ball) by the researcher and their intensity graded from easy to difficult had an effective role in accelerating the recovery process for players injured in the shoulder joint. One of the most important recommendations recommended by the researchers is that: Guide the proposed rehabilitation program under study in the rehabilitation of shoulder joint injury (partial dislocation) to speed up the recovery of athletes and return to the fields, and adherence to the conditions and standards for moving between the rehabilitation stages of the rehabilitation program because it includes consideration of individual differences and the safety and security factors it provides during the implementation of the program and avoiding the injured player being exposed to a physical load greater than his capacity.

Keywords: Rehabilitation exercises using weights (kettle ball), shoulder dislocation injuries

Introduction

Physical education is closely linked to other sciences, such as physiology, biomechanics, anatomy, psychology, and sports medicine, due to its close connection to the training process and how injuries occur. Sports medicine has contributed significantly to the safety of players and their protection from injury, as “physical injury may turn into negative psychological effects.” The player must prevent the development of his achievement. It is the responsibility of those working in sports medicine to protect players from injuries, as well as to return them to the field quickly and at the same previous level. This is done by knowing the types of injuries, their causes, and the best methods used to prevent them. Athletes are exposed to injury in all games when scientific and technical conditions are not taken into account in training or competitions, as a result of the continuous effort on all organs and systems of the body. Handball is one of the activities in which its players are exposed to repeated injuries, as handball is one of the games that require high physical effort due to the many types of movements related to speed, muscle strength and flexibility in which the body may be exposed

Corresponding Author:

**Dr. Mostafa Ibrahim
Abdelkareem**

Lecture, General Directorate of
Physical Education and School
Activity/Ministry of Education,
Iraq

to different types of injuries, as handball players are often exposed to shoulder joint injuries, which is one of the most important joints in the body and which bears a high percentage of the effort accomplished, which leads to the occurrence of injury. Delving into sports medicine studies, including sports injuries, is one of the important ways to develop the athlete's ability and protect him from injury on the one hand, and to guide the coach to take the correct and early measures to protect the player from serious complications that may prevent him from continuing his activity in the event of an injury. From the above, it is clear that players in various sports, especially handball, are exposed to many sports injuries, including shoulder joint injuries, which may weaken their skill performance, whether they occur as a result of external reasons or internal reasons such as feeling tired or poor performance. Warm-up, technical performance errors, and thinking about these errors while performing skills, and here lies the importance of the research in knowing the effect of rehabilitation exercises using weights (kettle ball) in rehabilitating partial dislocation injuries for handball players in Najaf Governorate clubs.

Research problem

Injury constitutes a physical and psychological obstacle, as it becomes an obstacle to achieving optimal achievement and reaching higher levels. In fact, the occurrence of injury when practicing sports activities is a phenomenon that does not agree with the health goals of physical education. Given the frequent exposure of handball players in Najaf Governorate clubs to various types of sports injuries, especially in the shoulder joint of the body, this topic has aroused the interest of the researcher in an attempt to address them and know their causes, dangers, areas of occurrence, and the extent of their impact on the performance of athletes in the performance of players, and the percentage of their presence in each match. This is in order to reach appropriate solutions to treat such sports injuries that affect the level of achievement and progress among handball players.

Research objective

- Preparing rehabilitation exercises using weights (kettle ball) to rehabilitate partial tear injury of the shoulder muscle in handball players of Najaf Governorate clubs.
- Identifying the effect of rehabilitation exercises using

weights (kettle ball) to rehabilitate partial tear injury of the shoulder muscle in handball players of Najaf Governorate clubs.

Research hypotheses

- There is a positive effect of rehabilitation exercises using weights (kettle ball) to rehabilitate partial tear injury of the shoulder muscle in handball players of Najaf Governorate clubs.

Research fields

- Human field: Injured young players in handball clubs in Najaf Governorate
- Time field: (12/8/2024) to (16/9/2024)
- Spatial field: Sports Medicine Center in Najaf Governorate

Research methodology and field procedures

Research Methodology

The researcher adopted the experimental approach with a single-group design with two tests (pre- and post-tests) to suit the nature of the research problem.

Community and sample research

The research community was represented by handball players for the clubs of Najaf Governorate, which were (Najaf Club, Kufa Club, Naft Al-Wassat Club) for the 2023-2024 sports season, and their number was (11) injured players. As for the sample, it was players with partial dislocation of the shoulder joint. By conducting the examination and medical diagnosis, the type of injury was determined. The research sample was determined and included (8) injured players, as they were chosen intentionally and through the clinical examination of the attending physician, as the type of injury was partial dislocation of the shoulder.

Homogeneity of the research sample

In order to control the variables that affect the accuracy of the research results, the researcher resorted to verifying the homogeneity of the research sample related to the morphological measurements, which are (height, body mass, training age), as the researcher used the torsion coefficient before starting to apply the main experiment on the research group (experimental), as shown in Table (1).

Table 1: Shows the homogeneity of the research sample.

Variables	Measuring unit	Median	Mean	Std. Deviations	Skewness
Length	cm	173.5	173	33.12	1.772
Weight	kg	68.2	68	6.213	1.022
Training age	month	20	19.6	1.324	0.193
Duration of injury	day	15	14.4	1.032	0.231
Type of injury	partial dislocation of shoulder joint				

Means, tools and devices used in the research:

Means of data collection

- Arabic and foreign sources and references.
- Personal interviews.
- Tests and measurements.
- Special forms for recording test results for students.

- Football field.
- Whistle number (2).
- Adhesive tape.
- Test results recording forms.
- Goniometer device.
- Weight measuring device.

Tools and devices used

- Electronic calculator (laptop) number (1).
- Electronic stopwatch type number (2).
- Plastic signs number (12).

Field research procedures

Measuring the range of motion of the shoulder joint

- The range of motion was measured using a goniometer to measure the range of motion of the shoulder joint in 4

different movements:

- The upward flexion movement
- The backward extension movement
- The outward extension movement
- The inward extension movement

Exploratory experiment

The exploratory experiment was conducted before starting the main experiment in order to identify the most important obstacles and negatives in order to address them, and the aim of the exploratory experiment is:-

1. To know the suitability of the tests for the research sample and measure their performance time.
2. To ensure the suitability of the hall and the tools used and their suitability for the tests.
3. To prepare the assistant work team, as well as to identify the difficulties they may face.
4. To know the difficulties that may face the work process and to develop the most appropriate solutions for them.

Pre-tests

The researcher conducted the pre-tests on (Tuesday) corresponding to (13/8/2024) at (9:00) in the morning in the hall of the Kufa Sports Club on a group of individuals from the research sample, numbering (8) players with partial dislocation.

Main experiment

The researcher prepared and organized rehabilitation exercises using different weights of (kettle ball) based on personal experience, using many scientific sources, and conducting many personal interviews in the field of sports rehabilitation and handball, and began "applying appropriate rehabilitation exercises that included strength exercises with different weights, as well as neuromuscular coordination and muscle balance exercises on members of the experimental group from 15/8/2024 to 15/9/2024, and taking into account (intensity, repetitions and appropriate rest periods). The researcher developed the rehabilitation exercises taking into account the physical characteristics of the players and some specialized references in sports injuries and rehabilitation, and using them in a manner consistent with the development of rehabilitation exercises and achieving their goals. The researcher identified the foundations for developing the exercises, which were represented by the following points:

1. Determining flexibility exercises that work on the shoulder joint according to the anatomical aspects and direction of the joint's muscular work.

- Gradual repetition.
 - Diversity in exercises.
 - Privacy.
 - Flexibility of the rehabilitation approach and its suitability for practical application
2. The degree of intensity in rehabilitation is appropriate according to the degree of flexibility of the shoulder joint, in terms of repetition and total rest periods.
 3. The aim of the rehabilitation exercises is to rehabilitate the injured players in the research sample and qualify them to return to training and tournaments again.
 4. Stop continuing to perform the rehabilitation unit in case the player feels tired or bored
 5. Taking into account the factors of security and safety.
 6. The program contains (6) weeks with three daily rehabilitation units to become (18) rehabilitation units.
 7. The number of repetitions was from (6-8) and the number of groups from (2) as the researcher determined the number of repetitions, the number of groups and rest times.
 8. The researcher gave appropriate rest times for the rehabilitation exercises.
 9. The researcher used rest times between repetitions of (30) seconds and between groups of (1-2) minutes.
 10. The number of repetitions ranged from (3-5) repetitions for each exercise and the totals from (1-2).

Post-tests

After completing the "implementation of the rehabilitation exercises using weights (kettle ball), the post-tests were conducted on the control and experimental groups on (Monday) corresponding to 16/9/2024 at nine o'clock in the morning in the same place and under the same conditions under which the pre-measurement was conducted.

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

Results and Discussion

Results

Presentation and discussion of the study results in the studied variables

Table (2) shows the arithmetic means, standard deviations, and the calculated (t) value for the correlated samples, the level of test significance, and the significance of the difference for the pre- and post-tests of the experimental group for the studied variables.

Table 2: Shows the arithmetic means, standard deviations, and the calculated (t) value for the correlated samples

Variables	Pre-test		Post-test		T value	Level Sig	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Upward flexion	62.000	11.34	90.000	12.21	12.721	0.000	Sig
Backward extension	74.000	13.16	96.33	11.32	14.322	0.000	Sig
Outward extension	82.000	10.21	96.000	11.06	9.881	0.000	Sig
Inward extension	81.000	18.63	102.000	18.22	12.063	0.000	Sig

Discussion

It is clear from Table (2) that there are significant differences at a significance level of 0.05 between the averages of the pre- and post-measurements of the experimental group in the test of measuring the range of motion of the shoulder joint with movements (extension upwards, flexion backwards, extensions outwards and approximations inwards), in favor of the post-measurement. The researcher attributes the reason for

this to the rehabilitation exercises using weights (kettle ball) which included joint flexibility exercises and muscle stretching of the arm joints used by the researcher. They had an effective impact in developing the range of motion of the joints in the arm used for handball players. This was confirmed by Sari Ahmed, Norman Abdel Razzaq (2001) ^[1] that stretching exercises increase the range of motion of the joints that the player needs to perform the required

movements (Sari: 2001, 54) ^[1]

Where Brunette, Gilpin, Brumitt and Meiera Brunette, Gilpin, Brumitt (2010) ^[4] Due to the unique shape of the Kettle ball and its ability to allow swinging in all directions, it also serves as a potential means not only to develop explosive power, muscle power and rapid strength, but also to develop flexibility and range of motion. Although the use of the Kettle ball has not been explored, its primary application is in developing explosive power and rapid strength through swing exercises. (Brumitt, 2010, 254) ^[4] The researcher also attributes the improvement in the range of motion of the various shoulder movements to the effectiveness of the prepared rehabilitation method and the significant positive effect of the exercises used and to the method of performing the exercises used in the research, as these exercises worked to reduce the range of motion by increasing the range of motion of the working joints in the shoulder area, by increasing the specific flexibility of the working muscles in the area, and thus increasing the range of motion of the joint. Rehabilitation exercises work to increase muscle flexibility and thus increase the range of motion of the joint. The researcher also attributes the reason for this improvement in flexibility to the rehabilitation exercises used in the research, which had an effective and clear impact on improving the flexibility and strength of the shoulder and elbow joints. This is what the results of the post-tests showed, as it increased the motor work of the shoulders from applying the exercises easily and comfortably without feeling pain. The sample's commitment to the exercises during the application of the method was a reason for the emergence of these results. The researcher believes that the importance of flexibility and its improvement is reflected in good performance in skills. Al-Lami (2010) ^[2] confirms that it is possible for the rehabilitation program to bring about stable changes and adaptations in the quality of flexibility, especially if it exceeds a period of (6) weeks. (Al-Lami: 2010, 204) ^[2] Rehabilitation is one of the most important and effective motor methods in treating injuries, as it works to strengthen the weak muscles surrounding the part to be rehabilitated and the flexibility of the joints, and helps restore the muscles and joints to their functions in the shortest possible time. Flexibility is very important for the player because it will provide protection in the future if it is well taken care of. (Othman) confirms that if flexibility is available, muscle, ligament and cartilage injuries decrease (Muhammad Othman: 2018, 648) ^[3].

Conclusions and Recommendations

Conclusions

- The use of rehabilitation exercises using weights (kettle ball) has shown a positive effect in improving the range of motion of the shoulder joint in handball players.
- The exercises prepared using weights (kettle ball) by the researcher and their intensity graded from easy to difficult had an effective role in accelerating the recovery process for players injured in the shoulder joint.

Recommendations

- Guide the proposed rehabilitation program under study in the rehabilitation of shoulder joint injury (partial dislocation) to speed up the recovery of athletes and return to the fields.
- Adherence to the conditions and standards for moving between the rehabilitation stages of the rehabilitation program because it includes consideration of individual differences and the safety and security factors it provides

during the implementation of the program and avoiding the injured player being exposed to a physical load greater than his capacity.

- Conducting a preventive compensatory program for athletes to strengthen the muscles working on the shoulder joint.

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