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The effect of using exercises with different weights and resistances in rehabilitating the flexibility of the shoulder and elbow joints for players injured in the shoulder and elbow joints in some sports

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Abstract

The research aims to know the effect of using exercises with different weights and resistances in rehabilitating the flexibility of the shoulder and elbow joints for players injured in the shoulder and elbow joints for some sports. The researcher used the experimental method using pre-post measurement for one group. The research sample was chosen intentionally from those injured with the shoulder and elbow joints, where he chose The researcher examined injured players from Naft Al-Wasat Club in games (football, volleyball, handball), and their number reached (10) injured players. The results showed, through applying the exercises, that there were statistically significant differences between the pre- and post-measurements of the research sample in favor of the post-measurement.

The researcher concluded: The use of various exercises has shown a positive effect in developing joint flexibility of the arms in young players in various sporting events. He recommends using exercises with different weights and resistances in rehabilitating the flexibility of the shoulder and elbow joints for players with shoulder and elbow joint injuries because of their positive effect on improving Muscular strength of the shoulder and elbow of players.

Keywords: Exercises with different weights and resistances

Introduction

The developed world is witnessing at the present time a great development in sporting achievements as a result of the continuous effort exerted by scientists through the interaction of physical education sciences with other sciences in various fields and specializations, and this rapid development in achieving achievements and high sporting levels in various fields of sports, whether in team sports or sports. Individual development goes in line with the progress of sports training sciences.

Sports medicine has played an effective role in developing the mechanical, functional and technical capabilities to protect the athlete from injury, in addition to methods for treating it and how to rehabilitate the athlete and return him to the field as quickly as possible. The first thing that constitutes an obstacle to maintaining an athlete's superiority is his exposure to various injuries during the period of time. Training or during competition.

As the exposure of various body tissues to external or internal influences "leads to anatomical and physiological changes at the site of injury, which disrupts the work or function of those tissues." Many people working in the sports field agree that the number of sports injuries has increased as a result of insufficient warm-up and the continuous high effort exerted by the athlete to reach the highest levels and achieve achievement. Osama Riyad and Imam Al-Husseini point out that "the rate of injuries in stadiums has increased despite the safety measures that have improved the situation." In most fields, playground accidents still directly threaten players.

Hence the importance of research in working to reduce or remove these pains and spasms, because with their presence, concentration and production will decrease, and the individual will resort to taking medical drugs, which have always had a negative effect on humans, and the most dangerous thing is cracking the joints and what results from it, so a treatment must be

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found for it. By preparing exercises with different weights and resistances to improve the flexibility of the elbow and shoulder joints and to reduce the severity of pain instead of using medications.

Research problem

Through the field practice of the researcher, as he is an athlete who follows various sporting events and who represents many sports clubs, surveying the opinions of specialists in this field, and reviewing many studies and research, the researcher noticed the widespread occurrence of these injuries and their frequent occurrence among players (handball, football, volleyball), which Most of the injured are prompted to see doctors for the purpose of treating the injury. The researcher also noted that the program used in traditional medicine takes a long time to treat and rehabilitate injured athletes, in addition to its lack of special exercises with different weights and resistances for the joints (elbow and shoulder) to develop flexibility, and the lack of a specialized staff to supervise the implementation process. In addition, following up on the established program, as the program is given to athletes by doctors in medical clinics and is applied qualitatively by the injured themselves.

From this standpoint, the researcher sought to know the effect of exercises with different weights and resistances on the flexibility of the shoulder and elbow joints of injured young players for some sporting events for the 2023-2024 sports season.

Research objective

- Preparing exercises with different weights and resistances to improve the flexibility of the shoulder and elbow joints for injured young players for some sporting events.
- Identifying the effect of exercises with different weights and resistances on the flexibility of the shoulder and elbow joints for injured young players for some sporting events.

Research hypotheses

- There is a positive effect of exercises with different weights and resistances on the flexibility of the shoulder and elbow joints for injured young players in some sporting events.

Research fields

- **Human field:** Young players injured in some sporting events
- **Time field:** (5/12/2023) to (20/1/2024)
- **Spatial field:** The indoor sports hall at Naft Al-Wasat Sports Club

Research methodology and field procedures

Research Methodology

“The study of the problem is what determines the correct approach followed by the researcher in arriving at solutions to the research problem”. For this reason, the researcher adopted the experimental approach with a single group design with two tests (pre- and post-tests) because it suits the nature of the research problem.

Community and sample research

The researcher's selection of the sample is one of the important steps of the research, and there is no doubt that the researcher thinks about the research sample from the beginning and defines the research problem and its objectives because the nature of the research, its hypotheses, and its plan speak in the steps and selection of its tools such as the sample, questionnaires, and necessary tests.

The research community represented injured young players in the Naft Al-Wasat Sports Club for some sporting events, which were (football, volleyball, handball) for the 2023-2024 sports season, and their number was (12) injured players. The sample was players with joint injuries (elbow and shoulder). By conducting a medical examination and diagnosis, the type of injury was determined. The research sample was determined and included (8) players, as they were chosen intentionally.

Sample homogeneity

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 morphological measurements, namely (height, body mass, training age), as the researcher used the skewness factor before proceeding to apply the main experiment to 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
Height	Cm	172.5	173	32.12	1.762
Weight	Kg	60.2	61	7.223	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	Dislocation of the shoulder and elbow joints				

From the results of Table (1), it is clear that the values of the skewness coefficient are smaller than (± 1), which indicates homogeneity the research community in all variables

Methods, tools and devices used in the research:

Data collection methods

- Arab and foreign sources and references.
- Personal interviews.
- Tests and measurements.
- Special forms to record test results for players.

Tools and devices used

- Electronic calculator (Laptop) (1).
- Electronic stop watch type (2).
- Plastic signs (12).
- Adhesive tape.
- Forms for recording test results.
- Genometer device.

Field procedures for research: Tests used

First: A test to measure the flexibility of the elbow joint

- **The aim of the test:** To measure the range of motion of

the elbow joint.

- **Tools used:** Goniometer to measure joint flexibility.
- **Procedures:** The laboratory takes a standing position and then bends the right or left arm as far as possible, with one arm of the goniometer on the forearm and the other on the upper arm.
- **Test instructions:** The tester must bend the elbow as far as possible.
- The laboratory has two attempts, the best of which is recorded.
- **Calculating degrees:** The angle that appears on the goniometer is read and the best reading of the two attempts is taken. (Zwerus EL, *et al.*, 2017) ^[7].

Second: Test to measure the flexibility of the shoulder joint

- **Objective of the test:** To measure the range of motion of the shoulder joint
- **Necessary tools:** Goniometer to measure joint flexibility.
- **Procedures:** The laboratory takes a standing position, then raises the right or left arm (high to the side, high in front, and high behind to the maximum extent, so that one arm of the goniometer is perpendicular to the ground and the other arm is parallel to the humerus).
- **Test instructions:** The tester must not bend the elbow. The tester should have his legs straight (natural standing position) so that the tester has two attempts to record the best of them
- **Calculating degrees:** The angle that appears on the goniometer is read and the best reading of the two attempts is taken. (Hasan, B, B., 2022) ^[2].

Exploratory experience

The exploratory experiment was conducted before starting the basic experiment in order to identify the most important obstacles and negatives in order to be addressed. The goal of the exploratory experiment is:

- Knowing the suitability of the tests for the research sample and measuring the time to perform them.
- Ensure that the hall and tools used are valid and suitable for the tests.
- Preparing the supporting work team, as well as identifying the difficulties they may face.
- Knowing the difficulties that may face the course of work and developing the most appropriate solutions to them.

Pre-tests

The pre-tests for the research sample were conducted on 12/6/2023, Wednesday, at ten o'clock in the morning, in the physical therapy hall at the Sports Medicine Center. The researcher conducted the pre-tests that were agreed upon by the experts and specialists, and all conditions related to the tests were taken into account. In terms of tools, devices, time and place, as well as the method of implementation.

Main experience

The rehabilitation approach is of great importance in treating and rehabilitating injuries, and after the researcher familiarized himself with most of the available scientific sources and sought help from the expertise of some experts in

the field of physical and joint rehabilitation and specialists to benefit from their sound opinions and guidance, and in order to achieve the research objectives, the researcher prepared exercises with weights and resistances to rehabilitate flexibility. The elbow and shoulder joints and the rehabilitation of the muscle groups in the joint according to scientific principles for the rehabilitation of injured people.

The curriculum prepared by the researcher was applied to the sample on Sunday, December 7, 2023. The exercises used in the curriculum were in the form of different and varied exercises inside the water and included several exercises for each rehabilitation unit, which included a group of exercises for the muscle groups and ligaments surrounding the elbow and shoulder joints, as the exercises Rehabilitation for the first and second weeks includes static exercises, and the progression was from easy to difficult, as the exercises in the first and second weeks did not contain resistance, while the third, fourth, and fifth weeks included exercises using small medical balls, as well as the use of rubber ropes inside the water for purposes, and the curriculum was graduated according to the capabilities of the injured person. And endure it until the pain appears. The prepared and designed approach is based on muscle strength exercises, stretching, flexibility, and flexion and extension exercises for the affected ankle using resistance.

- The duration of the qualification curriculum is 8 weeks.
- The total number of qualification units (24) training units.
- The number of rehabilitation units per week is three rehabilitation units.
- Rehabilitation days per week: Sunday, Tuesday, Thursday.
- Rehabilitation unit time (10-20 minutes).
- The curriculum included repetitions appropriate to the severity of the injury.

Post-tests

The researcher conducted the post-tests on 10/1/2024, Saturday at ten in the morning, after completing the implementation of the rehabilitation program of 24 rehabilitation units in the physical therapy hall at the Sports Medicine Center, in order to determine the extent of the effect of the exercises prepared in the same conditions in which the pre-tests were conducted.

Statistical methods

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

- Arithmetic mean.
- The mediator.
- Standard deviation.
- Standard error.
- T-test for correlated samples.

Results and Discussion

Presentation and discussion of the results of the study regarding the variables investigated

Table 2: Shows the arithmetic means, standard deviations, T-value calculated for the correlated samples, the significance level of the test, and the significance of the difference for the pre- and post-tests for the control group for the investigated variables

Variables		Pre-test		Post-test		T value calculated	Level Sig	Type Sig
		Arithmetic means	Standard deviations	Arithmetic means	Standard deviations			
Shoulder joint test (degree)	High aside	162.4	1.043	168.3	0.947	6.331	0.001	Sig
	High front	160.2	1.229	167.8	1.221	7.842	0.000	Sig
	High successor	32.6	0.944	35.8	0.867	4.057	0.002	Sig
Elbow joint test (degree)	Bend	142.5	1.421	148.4	1.115	6.055	0.000	Sig
	Extends	164.2	1.232	170.3	1.088	7.665	0.000	Sig

Discussing the results

It is clear from Table (2) that there are significant differences at the level of significance of 0.05 between the means of the pre- and post-measurements of the experimental group in the variable of joint flexibility of the arm used for the shoulder joint and the elbow in a movement high, side, high and backward, while the elbow was in a movement (flexion, extension), and in favor of the post-measurement, and the researcher attributes the reason This is because the exercises used with different weights and resistances, including exercises in water and stretching of the joints of the arms used by the researcher, had an effective impact in developing the range of motion of the joints in the arm used by young injured players, and this was confirmed by (Sari Ahmed Hamdan and Norma Abdel Razzaq 2001) [6]. Stretching exercises increase the range of motion of the joints that the player needs to perform the required movements.

The researcher also attributes the emergence of significant differences to the effectiveness of the rehabilitation curriculum that he prepared, which means that the exercises used with different weights and resistances have had a positive impact on the characteristic (flexibility of the joint), which is represented by testing the range of motion (Hasan, B, B, 2023) [2]. Flexibility is improved through stretching exercises that are prepared specifically for this purpose. The curriculum also includes Various exercises (with weights, rubber bands, and other means) were performed in the water, and these exercises gave effective and positive results in improving the research variables in general and the range of motion, especially since the injury to the elbow and shoulder joints and the pain that accompanies them directly affects movement, which leads to the weakening of the surrounding muscles. In the joint, determining its range of motion, and that the properties of water make water exercises of great benefit, because the density of water is heavier than the density of air, so when moving the legs in the water, they meet with great resistance. This resistance helps to raise the fitness of the affected member, such as strength and motor flexibility, and this is what was confirmed by (Mervat Al-Sayyid Youssef) "that the muscles gain the ability to elasticize as a result of water exercises" (Mervat Al-Sayyid: 1997, 222) [4].

Mufti Ibrahim Hammad pointed out that "joints always need continuous movement and need to move over a wide range in order to maintain their range of motion appropriately." (Mufti: 2010, 291) [5].

Conclusions and Recommendations

Conclusions

Based on the results reached by the researcher through applying the prepared rehabilitation approach to the research sample and through statistical treatments and within the limits of the study, he reached the following conclusions:

- The use of various exercises has shown a positive effect in developing joint flexibility of the arms among young

players in various sporting events.

- The exercises with different weights and resistances used by the research sample members have had a positive effect on the range of motion (upward, downward, normal condition).

Recommendations

According to the conclusions reached by the researcher and in light of the program used, the research sample, the data collection tools, and the statistical treatments used, the researcher recommends:

- Adopting various rehabilitation exercises prepared by the researcher at physical therapy centers.
- Necessity of paying attention to physical therapy and rehabilitation and forming a physical therapy center within sports clubs due to the necessity of avoiding and preventing sports injuries.
- Preparing brochures for different rehabilitation curricula and different injuries and approving them within physical therapy centers.

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