

THE EFFECT OF REHABILITATION EXERCISES USING RUBBER ROPES AND MOVING SHRINK IN THE REHABILITATION OF THE TORN LIGAMENT INJURY IN THE ANKLE JOINT OF BASKETBALL PLAYERS

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Abstract

The purpose of this paper is to recognizing the effect of rehabilitation exercises using rubber ropes and moving shrink in rehabilitating the torn ligament injury in the ankle joint for basketball players, identifying the differences between the results of the pre-and post-tests of the experimental and control groups in the rehabilitation of partial rupture of the calcaneal ligament of the ankle joint and the preservation of muscle strength and range of motion among basketball players, and to identify the differences in the results of the post-tests between the control and experimental groups in the rehabilitation of partial rupture of the calcaneal ligament of the ankle joint and the maintenance of muscular strength and range of motion among basketball players. The researcher used the experimental method with the design of equal groups for its suitability in solving the research problem and achieving its objectives. The research sample was chosen by the intentional method, amounting to (10) of those with torn ankle joint basketball players in Baghdad governorate clubs, and the ages of the injured athletes ranged between (20-22) years. The researcher divided the population into two equal samples (control and experimental), with (5) patients for the experimental group who learned the moving contraction and rubber ropes, and (5) patients representing (the control group) according to the traditional curriculum. One of the most important results reached by the researcher is that: Rehabilitation exercises using rubber ropes and moving shrinks had a great role in rehabilitating the torn ligament injury in the ankle joint for basketball players, and rubber ropes and moving shrink are among the successful resistances in strengthening the muscles surrounding the ankle joint and making movements according to the motor path of performance in the game of basketball. One of the most important recommendations recommended by the researchers is that: Adoption of rehabilitative exercises using rubber ropes and moving contractions because they had a major role in rehabilitating the torn ligament injury in the ankle joint for basketball players, and emphasis on the inclusion of the rehabilitation sessions from rubber ropes and moving shrink, as they are successful resistances in strengthening the muscles surrounding the ankle joint and making movements according to the kinetic path of performance in the basketball game.

Keywords: Rehabilitation exercises. Muscular strength. Basketball players

Introduction

Science plays a major role in the progress and development of various fields that man needs in building his healthy, educational, educational and recreational life and other fields that fulfil his desires and ambitions.

On the sports side, science plays a major role in setting the foundations and rules for practicing sports in terms of sports training or the sciences supporting it, such as mechanics, physiology, psychology, sports medicine, treatment and other necessary sciences that work to continue training and competition without interruption.

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Therefore, the science of injury rehabilitation is one of the important and basic sciences that work on returning the athlete after injury to exercise and competition without fear, pain or frustrating feeling that he is unable to practice again.

One of the sports in which friction and rapid movement and various injuries occur in it is the game of basketball, as the continuous jumping and rapid runs during exercise or playing generate various injuries of different degrees, including the injury to the rupture of the ligaments surrounding the ankle joint, and this gives a limitation in movement, pain and the player's inability to continue in play.

Thus, practicing rehabilitative exercises with therapeutic training methods gives a great and quick benefit in rehabilitating the injured, including rubber rope exercises that work to perform the moving contraction.

Hence the importance of research in rehabilitating injured basketball players after their injury and maintaining their physical and motor level according to the scientific and correct use of appropriate rehabilitation exercises from rubber ropes and moving contraction exercises.

Research problem

Ankle injuries are the most common injuries for basketball players as a result of rapid and sudden rotation and as a result of landing after incorrect jumping. One of these injuries is the injury of the partial ligaments surrounding the ankle joint, which hinders the player's movement, and requires rehabilitation and exercises to change the course of movement and performance and maintain the player's physical level.

Through the researcher's experience in the field of injury rehabilitation, he found that most injuries that occur to most different sports, including basketball players, and despite the presence of rehabilitation for them, the exercises used to qualify, but do not maintain the level of performance after rehabilitation because it is based on fixed and not mobile exercises, which may give better results in lifting level after injury.

For this reason, the researcher decided to try this type of exercise using rubber ropes and moving contraction, and to try it for the purpose of rehabilitating the injured ankles of basketball players.

Research objective

– Recognizing the effect of rehabilitation exercises using rubber ropes and moving shrink in rehabilitating the torn ligament injury in the ankle joint for basketball players.

– Identifying the differences between the results of the pre-and post-tests of the experimental and control groups in the rehabilitation of partial rupture of the calcaneal ligament of the ankle joint and the preservation of muscle strength and range of motion among basketball players.

– Identify the differences in the results of the post-tests between the control and experimental groups in the rehabilitation of partial rupture of the calcaneal ligament of the ankle joint and the maintenance of muscular strength and range of motion among basketball players.

Research hypotheses

– There are significant differences between the results of the tribal and remote tests in favor of the post-tests for the experimental and control groups in the rehabilitation of the partial rupture of the calcaneal ligament of the ankle joint and the preservation of muscle strength and range of motion for basketball players.

– There are significant differences in the results of the post-tests between the control and experimental groups and in favor of the experimental group in rehabilitating the partial rupture of the calcaneal ligament of the ankle joint and maintaining the muscular strength and range of motion among basketball players.

Research fields:

– Human field: Basketball players with torn ligaments in the ankle joint in Baghdad governorate clubs.

– Time field: (4/10/2021) to (9/11/2021)

– Spatial field: Basketball court at the University.

Elements to consider when training kinetic force

– The size of the resistance (the required load) and its intensity.

- The speed of movement.
- The number of repetitions.
- The number of strings (repetition of strings).
- The position of the body and the extent of the player's development.
- Rest in between.

Benefits of kinetic force training

- Developing all kinds of strength.
- Develop motor coordination.
- 3-Used in all age groups.
- It is used in all sports.

Ankle injuries

Ankle joint injuries are the most common injuries for basketball players, and the mobility of the joint decreases when the area is injured, which causes an obstruction in the functional work of the muscles. They are subjected to shortness and limitation in movement" (Raouf. 2005).

Ankle joint injury also constitutes a high percentage among most injuries in the sports field, and this injury is accompanied by many negative aspects to limit movement, and the occurrence of pain in the joint and what surrounds the joint and thus the occurrence of pain, and the inability to move and limit movement in the working ligaments and muscles (Anderson, B. 1989).

Research methodology and field procedures

Research Methodology

The researcher used the experimental method with the design of equal groups for its suitability in solving the research problem and achieving its objectives.

Community and sample research

The research sample was chosen by the intentional method, amounting to (10) of the basketball players with rupture of the ligament of the ankle joint in the Baghdad governorate clubs, and the ages of the injured athletes ranged between (20-22) years.

The researcher divided the community into two equal samples (control and experimental), and (5) patients for the experimental group learned about moving shrinks and rubber ropes, and (5) patients representing (the control group) according to the traditional curriculum, and the type of injury and the rehabilitation period was determined according to the medical diagnosis. Appointed by the specialist doctor and the sample was homogeneous and the two groups were equal in the research variables as in Table (1).

Means of collecting information

Data collection methods

- Arab and foreign sources.
- Statistical tools.
- Tests and measurements used.

Tools and devices used

- A tape to measure the length
- Medical scale
- stopwatch
- Straps, ropes and elastic bands for the affected joint

- Dynamometer

Tests used

Measurement of kinetic range (bending- extend) (Banwan. 2018)

- Measuring the range of motion in the event of tidal and bending by means of a Goniometer

- Tools used: Goniometer, reclining sofa, bench.

- Description of the measurement method: The person taking the measurement stands at the side of the laboratory (the injured) while he is sitting on the bench or the ground. The genomic device is placed on the area designated for measuring the affected ankle joint from the lateral and medial sides. Then the patient is asked to extend and bend the foot and the moving arm of the device moves with the axial line The mediastinum and the other remain fixed in their first position and reads the angle between the arms of the goniometer, which represents the angle of joint extension of the ankle

- Recording: The genome indicator refers to the measurement of the range of motion of the ankle joint in degrees.

Tests to measure the force of the muscles working on the ankle joint (Raouf. 2005)

Purpose of the test: To measure the bending force of the affected foot.

Description of performance: From the initial position, the patient with the maximum flexion of the foot and read the force recorded on the dynamometer in kilograms, and the value is converted to Newtons by multiplying it by 9.81.

Exploratory experience

The researcher conducted the exploratory experiment on 4/10/2021 on the same research sample by applying the proposed exercises and knowing the appropriate repetitions and how to perform them, as well as for the purpose of identifying the obstacles and difficulties facing the researcher in the main experiment.

Main experience

Pre-tests: The pre-tests were conducted on 10/10/2021

Exercises used for rehabilitation

After determining the quality of the rubber bands and the exercises for the mobile contraction, these exercises were programmed in the main section of the rehabilitation program for the therapist, which included (12) rehabilitation units for a period of (4) weeks, at a rate of (3) units per week.

The movement associated with performance and gradual loading was taken into account with an emphasis on comfort. The emphasis on the application of exercises was to strengthen the muscles accompanying the ankle joint, as well as increase the flexibility of the ligaments. The exercises were applied in the main experiment on 10/11/2021 and ended on 11/8/2021.

Post-tests: The post-tests were conducted on 9/11/2021.

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

Presentation, analysis and discussion of the results:

By noting tables (2), (3) and (4), there are significant differences between the tribal and remote tests of the research sample and in favor of the post-tests, as well as significant differences in favor of the experimental group, and this indicates the success of the rehabilitation programs for the control and experimental groups in returning the correct movement of the joint and strengthening the surrounding ligaments.

Table 1: Shows the homogeneity and parity between the two groups in the research variables.

Variables	Measuring unit	Control			Experimental			T value	Type sig	
		Arithmetic mean	Standard deviation	Skew ness	Arithmetic mean	Standard deviation	Skew ness			
body measurements	Age	Year	20.12	1.235	6.138	20.145	1.114	5.529	0.03	Non sig
	Length	Cm	180.65	2.356	1.304	180.64	2.658	1.471	0.005	Non sig
	weight	Kg	83.658	1.654	1.977	83.688	1.847	2.207	0.024	Non sig
kinetic range	bending	Degree	30.235	0.987	3.264	30.452	0.895	2.939	0.325	Non sig
	extend		15.442	0.423	2.739	15.523	0.562	3.62	0.23	Non sig
muscular force		Newton	72.564	1.235	1.701	72.551	1.332	1.835	0.014	Non sig

Tabular value (T) at degree of freedom (8) and level of significance (0.05) = 1.860

Table 2: Shows the values of (T) pre and post-tests the control group in the tests used.

Tests		Pre-test		Post-test		Standard error	T value	Type Sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
kinetic range	bending	30.235	0.987	31.88	0.234	0.578	2.846	Sig
	extend	15.442	0.423	16.54	0.352	0.447	2.456	Sig
muscular force		72.564	1.235	73.265	0.652	0.234	2.995	Sig

Tabular value (T) at degree of freedom (4) and below (0.05) = 2.132

Table 3: Shows the values of (T) pre and post-tests the experimental group in the tests used.

Tests		Pre-test		Post-test		Standard error	T value	Type Sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
kinetic range	bending	30.452	0.895	32.74	0.368	0.886	2.582	Sig
	extend	15.523	0.562	17.253	0.432	0.645	2.682	Sig
muscular force		72.551	1.332	74.68	0.741	0.678	3.14	Sig

Tabular value (T) at degree of freedom (4) and below (0.05) = 2.132

Table 4: Shows the post (T) values between the control and experimental groups in the tests used.

Tests		Pre-test		Post-test		T value	Type Sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation		
kinetic range	bending	31.88	0.234	32.74	0.368	3.944	Sig
	extend	16.54	0.352	17.253	0.432	2.564	Sig
muscular force		73.265	0.652	74.68	0.741	2.87	2. Sig

Tabular value (T) at (8) degree of freedom and below (0.05) = 1.860

In other words, the exercises used for the two groups achieved the requirements, and the researcher agrees with what was referred to by "Bastawisi Ahmed" that the exercises are organized and purposeful movements through which you obtain the development of motor and skill qualities in the field of life and sports (Ahmed and Al-Samarrai. 1984).

Also (Mervat El-Sayed Youssef) confirms that "muscles gain the ability to be flexible as a result of training" (Youssef. 1997).

As for the experimental group, its development came to the use of movable contraction and the use of rubber ropes, which had a great effect in strengthening the muscles surrounding the joint and rehabilitating the player according to the kinetic path to perform inside the basketball court, as (Mufti Ibrahim Hammad) indicated that "the joints always need continuous movement as they need movement in Wide range so that it maintains its range of motion appropriately (Hammad. 2010)

As well as the use of exercises with different resistances, as well as mobile exercises for lengthening and flexibility, which help to activate the muscle cells and thus strengthen them, which is an increase in muscular strength, whether it is for the muscles of the legs, which greatly contributed to raising their level and this is what Hashem Al-Kilani points out: "Training with weights and using some tools It has a quick and effective effect on the growth of muscle strength on the one hand and the increase in muscle size on the other" (Al-Kilani. 2000)

As well as the game of these exercises to improve physiological functions and the arrival of food represented by blood loaded with many useful mineral elements for the injured part, and therefore the flow of blood in a consistent and correct flow will lead to an increase and regularity in the blood circulation and thus will contribute and work to the density of the thickness of the muscle fiber and increase its muscle area, which It is one of the correct and important foundations in increasing and improving muscle strength, and this is confirmed by (Raouf. 2005) that muscle strength is positively affected by heat and movement, which leads to faster blood flow and thus delivery of oxygen and food to the affected areas and improvement occurs in muscle fiber density and increase in its area.

Conclusions

The researcher concluded the following:

– Rehabilitation exercises using rubber ropes and moving contraction had a great role in rehabilitating the torn ligament injury in the ankle joint for basketball players.

– Rubber ropes and moving shrink are among the successful resistances in strengthening the muscles surrounding the ankle joint and making movements according to the motor path of performance in the game of basketball.

Recommendations

– Adoption of rehabilitative exercises using rubber ropes and moving contractions because they had a major role in rehabilitating the torn ligament injury in the ankle joint for basketball players.

– Emphasis on the inclusion of the rehabilitation sessions from rubber ropes and moving shrink, as they are successful resistances in strengthening the muscles surrounding the ankle joint and making movements according to the kinetic path of performance in the basketball game.

References

- Anderson, B. 1989. Stretching. Shelter Publications,inc. California, USA.
- Bashar Hassan Banwan. 2018. The effect of a rehabilitation approach using Kinesio tapes and therapy in the rehabilitation of athletes with partial rupture of the hamstring muscles: PhD thesis, College of Physical Education and Sports Sciences, University of Baghdad.
- Bastawisi Ahmed and Abbas Al-Samarrai. 1984. Teaching methods in physical education: University of Mosul,.
- Farqad Atta Raouf. 2005.A comparative study between two proposed approaches for the rehabilitation of soft tissue injury to the ankle separation and their effect on some biomechanical variables: PhD thesis, College of Physical Education - University of Baghdad.
- Hashem Al-Kilani. 2000. Physiological bases of exercise: Baghdad, Al-Falah Library,.
- Mervat El-Sayed Youssef. 1997. The effect of a proposed program using water exercises to rehabilitate the working muscles on the knee joint, anterior injured ligament surgery, (Scientific Journal, Faculty of Physical Education for Boys, Cairo, Helwan University), p. 222.
- Mufti Ibrahim Hammad. 2010. Physical fitness for health and sports: 1st edition, Cairo, Dar Al-Kutub Al-Hadith.