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A Proposed Rehabilitation Approach to Rehabilitate the Working Muscles on the Knee Joint after the Operation to Remove the Bony Spurs Below the Patella Bone for Some Athletes

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Abstract---*The importance of the research lies in setting up a rehabilitation program that includes a set of exercises whose purpose is to rehabilitate the knee joint after the operation of removing the bony protrusions under the patella bone through strengthening the muscles working on it and comparing this program with the traditional program applied in hospitals. As for the research objectives, they are to prepare a proposed rehabilitation approach to rehabilitate the working muscles on the thigh joint after the process of removing the bony protrusions under the patella bone, as well as to know the effect of the proposed rehabilitative approach to rehabilitate the working muscles on the thigh joint after the process of removing the bony protrusions below the patella bone and the assumptions that the researchers assumed are for the proposed rehabilitative approach An effect on the rehabilitation of the working muscles on the knee joint after the operation to remove the bony protrusions below the patella bone, as well as the proposed rehabilitative approach that develops the strength of the muscles working on the knee joint faster than the traditional method applied in the hospital. In Chapter Three, the researchers used the experimental approach to suit the nature of the study. As for the research sample, it was from the players who underwent the removal of bony protrusions under the patella bone for various reasons and their number was (6) players. The two researchers used a set of tools and devices for the purpose of the research procedures, as well as homogeneity and parity for the two groups. The exploratory experiment and then the main and the rehabilitative program and the tests used in the research .. As for the fourth chapter, the results were presented and discussed, where the researchers concluded by discussing the results that the proposed rehabilitative approach developed the strength of the muscle groups of the thigh after removing the bony protrusions below the patellar bone faster than the approach applicable in the hospital. In light of the conclusions, the researchers recommended the necessity of using static and moving exercises in the rehabilitative curriculum, as static increases the strength of the muscle and moving increases the magnitude of the muscle and it is followed by athletes after removing the bony protrusions below the patella bone and also for workers in the field of rehabilitation the need to pay attention to rehabilitative exercises in their rehabilitation programs for the injured to see the effect of the exercises used on the injured and the extent of their development.*

Type of Paper--- *Review*

Keywords*: Proposed Rehabilitation Approach, Rehabilitate the Working Muscles*

Definition of the research:

Introduction and Importance of Research:

In recent years, a clear increase in knee injuries was detected (according to the Swiss accident statistics, 60 - 80 cases per 100,000 people). Sports accidents were responsible for 65% of knee injuries, especially skiing, football, baseball, basketball and some activities in athletics. Anterior cruciate ligament injury is the most common ligament injury (70%),

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followed by injury to the posterior cruciate ligament and then cartilage. The patella bone is followed by injuries due to its anatomical location at the front of the knee joint, which is more likely to receive external trauma, as well as the appearance of protrusions below the knee due to inflammation of the synovial sac that covers the kneecap from the bottom, or because of the genetic type of the patella bone, or because of the erosion of the meniscus or from the increased pressure, especially when Loading weights during the training period and after the player is exposed to these protrusions, the injured cannot play again in a typical manner, as great pain occurs during the extension and bending of the knee joint as well as during jumping or sitting where these protrusions or protrusions touch some tissues close to them, such as the outer edges of cartilage or some Nerves In this case, there must be a surgical intervention aimed at removing these bumps by surgical intervention. From here the researcher wanted to clarify the importance of their research by developing a rehabilitation program that includes a set of exercises intended to rehabilitate the knee joint by strengthening the muscles working on it and comparing this program With the traditional program in place in hospitals.

Research Problem:

The research problem was summarized by the researchers' follow-up to the rehabilitation program used in the physiotherapy department at Al-Diwaniyah Teaching Hospital, as this program was not graded through the intensity of exercises as well as the dependence of most therapists on thermal physical therapy devices and not relying on rehabilitative exercises that are more likely to return The strength of the muscles working on the knee joint to its normal position. Therefore, the researcher decided to develop a scientifically detailed and studied rehabilitation program, including a set of exercises, to work in a gradual and accurate manner.

Research Objectives:

- Preparing a suggested rehabilitation approach to rehabilitate the working muscles on the thigh joint after the operation to remove the bony protrusions below the patella bone
- Knowing the effect of the proposed rehabilitative approach to rehabilitate the working muscles on the thigh joint after the operation to remove the bony protrusions below the patella bone

Research hypotheses:

- The proposed rehabilitative approach has an effect on the rehabilitation of the working muscles on the knee joint after the operation to remove the bony protrusions below the patella bone
- The proposed rehabilitative approach develops the muscle strength working on the knee joint faster than the traditional approach applied in the hospital.

Research areas:

- The human field: Some (6) athletes who suffer from the presence of bone spurs below the patella bone.
- The time frame: the period from 10/07/2019 to 27/9/2019
- Spatial field: Physiotherapy center at Al Diwaniyah Teaching Hospital, SPORT hall for agility and body building.

Research methodology and field procedures

The induction approach:

The researchers used the experimental approach to suit the nature of the problem under study

Research Sample:

The research sample consisted of (6) athletes who had undergone the removal of bone spurs below the patella bone, and they were divided into two groups by (3) athletes for the (control) group and (3) athletes for the (experimental) group.

devices and tools:

A group of devices and tools were used for the purpose of completing the course of the used rehabilitation program.

- Weighing scale
- Electronic stopwatch
- Treadmill device
- Medical bike type (perocs)
- Weights of different weights
- Rubber ropes
- Ice bags
- Compression garment
- The genomic device
- The wrists of different weights

homogeneity and parity among the members of the research sample (control and experimental)

Table No. (1) Shows the homogeneity of the control group members

indication	the difference	deviation	the middle	the exams	No
homogeneous	28.87	0.87	3.00	Quadriceps muscle	1
homogeneous	20.00	0.50	2.50	Back muscles	2
homogeneous	21.65	0.29	1.33	Connective muscles	3
homogeneous	8.66	0.29	3.33	Lateral thigh muscles	4

Table No. (2) shows the homogeneity of the experimental group

indication	the difference	deviation	the middle	the exams	No
homogeneous	28.87	0.87	3.00	Quadriceps muscle	1
homogeneous	20.00	0.50	2.50	Back muscles	2
homogeneous	21.65	0.29	1.33	Connective muscles	3
homogeneous	8.66	0.29	3.33	Lateral thigh muscles	4

Table No. (3) Shows equivalence, showing the individuals of the research sample

indication	The computed t value	Experimental group		Control group		Tests (kg)	No
		A	Q	A	Q		
0.89	0.14	0.52	2.92	0.87	3.00	Quadriceps muscle	1
0.29	1.22	0.50	2.00	0.50	2.50	Back muscles	2
0.52	0.71	0.29	1.17	0.29	1.33	Connective muscles	3
0.52	0.71	0.29	3.17	0.29	3.33	Lateral thigh muscles	4

Exploratory Experience:

The exploratory experiment is "a preliminary experimental study that the researcher conducts on a small sample before conducting his research with the aim of choosing research methods and tools.

The exploratory experiment was conducted by an athlete with a protrusion below the patella bone on 10/7/2019 at ten in the morning at the Limb Rehabilitation Center / Diwaniyah Teaching Hospital. The aim of the experiment is to identify the work of the devices and devices used in the experiment and to know the accuracy of the tests and measurements that are used in the research as well as to identify In the form of performance of the rehabilitating exercises used in the research.

tests used in the research.

A- The quadriceps muscle strength test.

All the tests used are performed by lying on the medical bed and using a set of weights in the form of a kit filled with iron filings, as shown in Figure (1)

Figure (1) shows a type of weights (ketter) that was used to measure the strength of the thigh muscles

Where the patient performs each test by adding weight gradually to the moment of feeling the pain knowing that the test is applied a week after the operation and for all the muscles of the thigh (quadriceps, posterior, connective, lateral), as shown in Table (4).

Table No. (4) Shows the tests used in the research

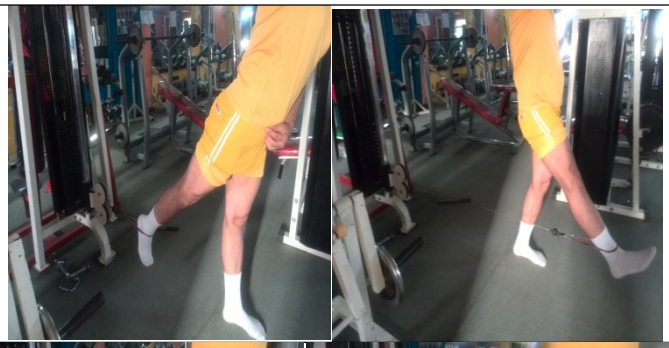
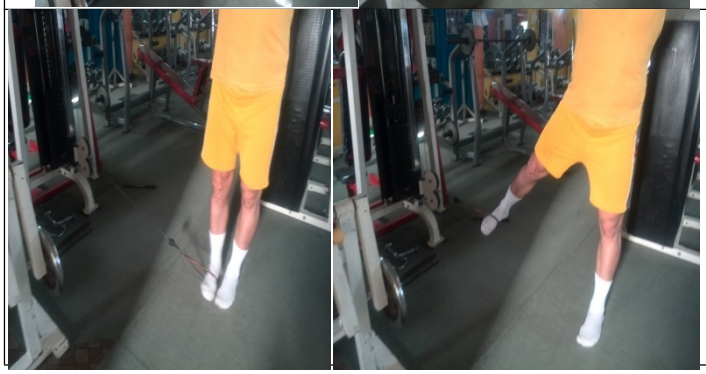
Test form	Name of the test	No

	1. Testing the strength of the thigh muscles through the front lift movement (quadriceps muscle)	1
	2. Testing the strength of the thigh muscles (posterior muscles) posterior pull	2
	3. Testing the strength of the quadriceps (connective muscles) inward lifting	3
	4. Lateral lift (lateral muscle) quadriceps strength test	4

Rehabilitation program

The researcher prepared an integrated rehabilitation program for the rehabilitation of the knee joint after removing the bony protrusions below the patella bone through the development of strength for all thigh muscles. The thigh muscles to atrophy significantly and this phenomenon continues if it is treated quickly immediately after the operation. where the surgery was performed for the injured on 7/20/2019 in the Diwaniyah Teaching Hospital at nine in the morning, then the research sample of the injured was divided into two groups, a control group (3) athlete and an experimental group, number (3) athlete. Whereas, the control group underwent treatment at the Physiotherapy Center at Al-Diwaniyah Teaching Hospital according to the curriculum prepared by the hospital As for the experimental group, it underwent rehabilitation through the curriculum prepared by the two researchers, which consists of (6) weeks. By the rate of one training unit per day of the week and continuing for a period of (6) weeks, the rehabilitation program begins one week after the operation.
Table No. (5) Illustrates some of the exercises used in the rehabilitation curriculum.

Table No. (5) Shows some of the exercises used in the rehabilitation curriculum

Exercise form	Name of the exercise
	1- From standing with the body tilting forward a little pull (cable) from back to front to strengthen the quadriceps muscle without bending the knee joint
	2- From standing aside, pull the cable from outside to inside to strengthen the connective muscles of the thigh without bending the knee joint

Presentation, analysis and discussion of results
presenting the results of the pre and posttests in the variables under study for the control and experimental group

Table No. (6) Shows the arithmetic mean and standard deviation for the pre and posttests in the variables under study and for the control and experimental groups.

indication	The computed t value	Post test		The pretest		Variables (Kg)		No
		A	S	A	S			
0,03	5.38	1.53	10.33	0.87	3.00	Female officer	Quadriceps muscle Back muscles	1
0.00	18.38	1.00	14.00	0.52	2.92	Experimental		
0.06	4.04	1.00	6.00	0.50	2.50	Female officer	Connective muscles	2
0.00	16.00	1.00	10.00	0.50	2.00	Experimental		
0.01	8.32	1.00	5.00	0.29	1.33	Female officer	Quadriceps muscle Back muscles	3
0.01	13.98	0.58	7.33	0.29	1.17	Experimental		
0.03	5.55	1.15	6.67	0.29	3.33	Female officer	Connective muscles	4
0.01	13.98	0.58	9.33	0.29	3.17	Experimental		

* Tabular value (t) at the degree of freedom (2) and the level of significance (0.05) = (4.30)

Discuss the results

Through the above results, we notice that the members of the experimental group had a clear improvement in the strength of the thigh muscle (the quadriceps) during the period of their rehabilitation program of (6 weeks), which is the same period in which the control group was rehabilitated, and the researcher attributes that to the effect of the

rehabilitation program that was developed For the experimental group, which leads to improving the strength of the thigh muscles in the lifting and pulling tests (quadriceps, posterior muscles, retractors and lateral muscles) and gives the muscles that work to lift the leg more strength through the continuity of the experimental group members in the rehabilitation program and the various exercises included in the program, static and moving, which is often This leads to stimulating the muscular system, which leads to improvement in strength, as the rate of strength growth develops through different exercises that combine static and moving training, and this is consistent with what the two researchers (Jeffrey Wafa Lakel) (1986) confirm that the development of moral strength is by choosing isometric and isotonic exercises that perform During the proposed training program to reach better results for the development of the strength characteristic. As well as the remarkable development in the strength of pulling the posterior muscles of the thigh during the training period of (6) weeks, noting that the control group members were also able to achieve a relatively clear increase during the period of their program, but it was less than the experimental group, where the development of the strength of pulling the posterior muscles of the thigh was clear and fast and exceeded the increase that It was achieved by the control group, through continuous training among the members of the experimental group and continuous follow-up by the researchers .. The researcher attributes the weakness of development among the members of the control group to the rehabilitation program in the Limb Rehabilitation Center, which is considered one of the traditional programs through the type of exercises used, the number of repetitions and other things. Concerning the rehabilitation program, all this led to a weak development in the thigh muscle strength of the control group members. Hunter & Nosse (1985) confirmed that the more times a week of training increased, the rate of strength growth increased and the rate of decline of strength was faster after the end stage Training and vice versa, meaning that the number of times a week of training has a large and effective role in the progress of the level, but we must not overlook the intensity of training because the growth of strength It depends on the number of repetitions of the weekly training as well as the intensity of training excitement and through the researcher's observation of the exercises used by the members of the special control group for the thigh muscles, they are general exercises that are not focused, that is, they focus on muscles without others, where the exercises and the loads given must be inclusive of all the muscles working on the affected joint, as Mufti Ibrahim (2001) sees that “one of the most important. The foundations in preparing the rehabilitative curricula are to determine the ideal load for rehabilitative exercises, where the ideal load is defined as the specific amount of influence that occurs on the various organs and systems of the individual when practicing civic activity, as well as the effort or the physical and nervous burden on the body’s organs and apparatus, and a reaction to the physical performance performed.

Where the researcher gave constant and moving exercises comprehensively for the thigh muscles (the posterior quadriceps, macrophages and lateral) in a focused manner, with the aim of developing it well, and this was observed through the results obtained by the experimental group, as if we noticed the big difference in the connective muscle strength of the group.

The experimental as well as the lateral muscles. Yes, there is a development among the members of the control group, but a relative development, that is, it came through the exercises given to the quadriceps and posterior muscles of the thigh, where the researcher attributes the improvement in relation to the strength variable (of the thigh muscles) to the distributions of exercises that helped to develop the working muscles during the rehabilitation approach and also to the effect of various exercises on increasing strength in muscle groups due to the increase in continuous resistance and increasing the number of repetitions performed by members of the experimental group.

Presenting the results of the post-tests in the variables under study for the control and experimental groups

Table No. (7) Shows the post-tests in the variables under study for the control and experimental groups

indication	The computed t value	Post test		The pretest		Tests (kg)	No
		A	S	A	S		
0.01	5.38	1.00	16.00	1.53	10.33	Quadriceps muscle	1
0.01	4.90	1.00	10.00	1.00	6.00	Back muscles	2
0.02	3.50	0.58	7.33	1.00	5.00	Connective muscles	3
0.02	3.58	0.58	9.33	1.15	6.67	Lateral thigh muscles	4

Discuss the results

Through the above results, the researchers attribute this development in the post-test for the members of the experimental group in the variable strength (the quadriceps muscle), which is considered one of the largest muscles of the body in size compared to the development of the control group members to its application and permanent supervision by the researcher and regularity with the vocabulary of the rehabilitative approach and its application well By the experimental group, it had a great impact on this development, this means that the vocabulary of the curriculum was consistent through the use of static exercises and moving exercises had a clear effect on the development of strength for this muscle as the strength increases with the increase in the use of physical exercises and decreases in the case of not moving the part and this is

consistent With (Jeffrey and Falkel) (1986) (that the development of moral strength is done by choosing fixed and moving exercises performed during the training curriculum to reach better results to develop the characteristic of strength) (). Also, the level of strength elevation is not necessarily a muscle enlargement, but rather it can be dependent on the efficiency of the nervous system in stimulating or improving muscle function. And that what the members of the experimental group obtained from the growth in the amount of lifting force of the thigh muscle (the quadriceps muscle) was greater than that obtained by the members of the control group, that the amount of development for this test, which was recorded by the quadriceps muscle, proves the effectiveness of the proposed training program that develops this muscle responsible for Raise the thigh to the top and this is consistent with what was confirmed by (Raysan Khuraibet) (1991) that the quality of the muscle can be identified by knowing the extent of what you can carry or the degree of endurance on it, as well as the amount of work it produces.

Also, through these results, we conclude that the amount of development of the members of the experimental group is higher and in a clear percentage of the amount of development that the members of the control group reached. In both groups, there was an improvement in the strength of pulling the thigh muscles, but the fastest and largest development was for the members of the experimental group, and this confirms that the training program The proposal develops the thigh muscle groups for pulling force in a greater and faster way than the training program followed in the hospital, and the researcher attributes this improvement to the proposed program's containment of various training exercises that increase the frequency of muscle contractions, leading to better strength growth and development, and this is in agreement with both Bernier and Levi (berna & levy) that regular exercises for maximum strength due to the building of more muscle fibrils (myofibrils) and enlargement of the working muscle cells, and the increased pressure also occurs as a positive result in the growth of ligaments, tendons and bones)

From the above and through the results of all tests to measure the strength of the thigh muscle groups for the experimental and control groups, the researcher sees that behind these different results, which showed a remarkable development for the members of the experimental group and a relative development for the control group members, many reasons, including the difference between the two samples used in those tests in terms of ages and different mathematical levels As it was a highly trained person or a hero, as well as the thigh muscle groups and their relationship to the angles of the knee joint in which the operation was performed for the purpose of obtaining the maximum possible muscle contraction force that helps restore the muscle to its normal state before the injury.The researcher was also able, through the application of the proposed program, to avoid any case of muscular atrophy that may occur to the injured after the surgery and from the first day and through his performance of the training program, and this is consistent with what was confirmed by the scientist (ASTRAND) that people who stay in bed due to injury They can avoid muscular dystrophy by contracting their muscles for a period of seconds to match one-third of the maximum strength of the muscle. The contraction is not required here. This means that most injured athletes can train enough to prevent muscular atrophy. On the other hand, the scientist ASTRAND stated that the loss of muscle strength is more when the muscle is placed in a plaster cast due to the lack of transmission of nerve stimuli to it, it is possible for a person to lose 20% of his muscle strength within one week of stopping training

Conclusions and recommendations

Conclusions:

- The proposed rehabilitative approach improved the strength of the muscle groups of the thigh after removing the protrusions below the kneecap more quickly than the method used in the hospital.
- The increase in the size of the thigh muscle in the experimental group is an evidence of the development of strength in them
- The proposed approach was more focused than the one applied in the hospital in terms of the number of exercises given, as well as its inclusion of fixed and moving exercises for each muscle of the thigh muscles.

Recommendations:

- The necessity of using static and moving exercises in the rehabilitative curriculum, as static increases the strength of the muscle and moving increases the magnitude of the muscle and is followed by athletes after removing the bumps below the kneecap
- Personnel working in the field of rehabilitation must use consecutive or intermediate tests in their rehabilitation programs for the injured to know the extent of the impact of the exercises used on the injured and the extent of their development in order to make some modifications in the curriculum if there is a mistake.
- It is necessary and necessary to give exercises to the injured one day after the operation was carried out in the form of contraction with continuous relaxation of the muscles working on the joint in which the operation was performed without moving the joint, in order to avoid the adhesion processes that occur between the fibers in the absence of movement.
- The necessity for athletes to be informed of the proposed curriculum and the details of it so that they can work with it if one of them is injured.

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