

REHABILITATION PROGRAM FOR TREATMENT OF SIMPLE WRIST LIGAMENTS TEAR FOR SOME STUDENTS IN ARTISTIC GYMNASTICS LESSON

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Abstract

This study aims to prepare a rehabilitation program for the treatment of simple wrist ligament torn for some students of artistic gymnastics and determine the effect of this rehabilitation program on treatment. The hypothesis of the study says that there are statistically significant differences as a result of the prepared rehabilitation program for treatment of simple wrist ligament tear for some artistic gymnastics students. As for the used methodology, the researcher used the empirical method. The population of the study is represented in students of Physical Education School in Koya University in the third stage. The sample of the study was some students who are injured with wrist ligament tear in artistic gymnastics (7 students). The rehabilitation program was prepared after being presented to experts for treatment of the said injury using a set of treatment exercises for the wrist joint. The rehabilitation program was followed with consideration of gradual intensity, time, frequencies and break periods. The selected pre and post-tests of the study were chosen reaching results after analyzing data and the use of suitable statistical methods. The study then reached the most important recommendations and conclusions that can be summed up in the following: (there are significant differences in all tests of the study between pre and post tests for the sake of post-tests). As for recommendations, they include: (the necessity of practicing strength training in general during practicing all games and for all students, the necessity for gymnastic players to possess suitable physical characteristics that are consistent with all given skills).

Key Words: Injury, tear, ligaments of simple wrist joint, artistic gymnastics for men

1. INTRODUCTION

There are a lot of people who get injured whether in sport or in other events. Many of them get this kind of injuries which make them use various methods that have a positive effect on improving their healthy conditions. In addition, these injuries may lead the athletes to leave the sport field or reach a state of psychological dissatisfaction as a result of physical harm on their sport levels.

Among these injuries, there are wrist joint tears. They are among common injuries in a lot of sport games including gymnastics. Their symptoms include great pain, swelling and small ligament tears between joint bones with restrictions of joint movements. In case of wrong treatment, it affects the function of wrist especially in moves that control radius and ulna in lower forearm and severe injury may be greater if ignored and may require surgery interference (5:189).

A tear, in itself, is a pull apart of muscle tissues or ligaments as a result of violent muscular effort more than a muscle can bear. Causes of injury are inconsistency of contraction between two groups of muscles or being contradicted in operation, great loss of water and salts, accumulation of secondary remains in the muscle resulting from muscle contraction, severe and sudden muscle contraction, great effort which is more than a muscle's power, differences in the power of muscle groups during training and poor warming-up of muscle groups (: 6). In addition, the simple wrist joint tear injury represent great importance and danger on athlete's life, especially gymnastics players due to their continuous need to practice different motor and sport skills. Gymnastics are characterized with difficult motor skills and their performance requires high accuracy and physical abilities with absolute power. Moreover, gymnastics is a sport of complete fitness as it contains in essence consistency between body and muscles by giving players resiliency, agility, speed and power. It is preferred to practice gymnastics at ages from 4 to 5 years besides it is considered among the most important Olympic games that are watched by a lot of people around the world. (7: 205).

Because of continuous and intense training and the lack of necessary strength for optimal performance of athletes, they face this type of injuries due to difficulty of most motor skills in men's gymnastics and those who practice it in early ages. In addition, students of Physical Education School do not perform correct and equal prior training which led to these injuries, especially in case of repeated motor skills that certainly affect their performance level. Injuries may be more complicated in case of not having enough medical care, so there are treatment methods with correct methods and without complications. These methods ensure safety of students and gradual recovery. Their effect is clear as there are symptoms that affect the athlete's potential and may lead him to stop practicing suitable sports. Thus, it was required to set a rehabilitation program using a set of treatment exercises. These exercises are defined as: "movements based on psychology diagnosis in order to restore the body's normal state and to be near normal operation of the body" (4: 198). This program aims to restore the athlete's normal state and to be able to perform this

sport with all its motor skills easily. Hence, the researcher thinks that the significance of the study lies in preparing a rehabilitation program for the treatment of simple wrist ligament torn for some students of artistic gymnastics in the Physical Education School at Koya University as these students suffer from severe pains and lack of suitable physical attributes to respond the requirements of gymnastics. This program may contribute positively to set proper solutions for them in order to prevent complications of this injury in the future and to develop their performance level significantly. The hypothesis of the study was including that there are statistically significant differences as a result of the prepared rehabilitation program for treatment of simple wrist ligament tear for some artistic gymnastics athletes.

Procedures of the Study

The researcher used the empirical method as it is proper to the nature of the problem of the study.

Population & Sample of the Study

The population of the study consists of Physical Education School in Koya University in the third stage for the academic year 2013 / 2014 (39 students). The sample of the study was some students who are injured with wrist ligament tear in artistic gymnastics lesson for men (7 students) chosen purposively by the researcher.

Field Procedures of the Study:

Determining Degree & Type of Injury

The researcher presented all members of the sample to the specialized doctor for correct diagnosis and to determine degree and type of injury. The injury was diagnosed as first degree (simple) injury, then they took a break for two (2) weeks and then they applied the rehabilitation program.

Determining the Used Tests in the Study

The researcher chose a set of tests and presented them to a group of experts to choose the most suitable of them as follows:

1. Test of skewed prostration from standing (7:91)
2. Test of bending arms from standing on hands and leaning on the wall (6:158)
3. Test of pushing upwards on the parallel bars (9:65)
4. Test of pulling upward (9:69)
- 5.

Preparing the Rehabilitation Program:

The researcher prepared and designed the rehabilitation program after reviewing a set of modern references and the program was as follows:

- A) The program included a set of rehabilitation exercises related to wrist joint.
- B) The duration of the program was 6 weeks (3 rehabilitation units per week) outside the times of gymnastics lesson.
- C) The researcher considered (repetitions, breaks within repetitions, time and the used intensity) during program application.
- D) Gradual intensity was considered from 55% to 80%.
- E) Gradual increase in the used time for performance was considered.
- F) Items of the rehabilitation program were presented to a group of specialists in the field of sport training, sport medicine and psychology in order to determine their validity with consideration of proposed amendments by experts.

Pre-tests:

The researcher conducted pre-tests on the sample of the study on 13/04/2014 in Martyr Khaled Hospital at Koya City and the internal hall of the Physical Education School in Koya University. All tests set by the researcher were conducted with the help of the assistant working team.

Application of the Rehabilitation Program

After completing the technical test, the researcher applied terms the rehabilitation program on the individuals of the sample for the single empirical group (due to small number of sample members).

Post-Tests

Post-tests were conducted on Sunday 25/04/2014 after completing and implementing the rehabilitation program with consideration of conducting the tests by the same way by which the pre-tests were conducted.

- 1- Arithmetic Mean.
- 2- Standard Deviation.
- 3- The T- Test for symmetric samples.

3. Discussion of Results:

Table (1) shows that all variables of the study include statistically significant differences at significant level (5%) and freedom degree (6) for the sake of post-tests and measurements.

Table (1): Statistical Features of the Empirical Group in Pre and Post Tests at Tests of the Study

Tests		Mean	S.D	Means Variance	S.D	T Counted Value	Error level	Significance
Test of skewed prostration from standing	Pre	15.12	6.93	21.25	8.66	6.93*	0.000	Significant
	Post	36.37	15.1					
Test of bending arms from standing on hands and leaning on the wall	Pre	6.25	4.02	11.6	3.2	*10.26	0.000	Significant
	Post	17.87	6.35					
Test of pushing upwards on the parallel bars	Pre	7.62	4.27	19	12.2	*4.405	0.003	Significant
	Post	26.62	15.42					
Test of pulling upward	Pre	7.37	4.8	32	18.53	*4.88	0.002	Significant
	Post	39.37	23.08					

* Significant at level $\leq (0.05)$

The researcher found that the reason for the significant differences in all tests is that preparation of the rehabilitation program contributed and affected positively the improvement of conditions of the athletes injured with the simple wrist tear, especially when they are practitioners of sport activity as they are students of physical education. Significant differences are also due to the fact that all tests set for the sample are related to strength especially that the injury happened during the gymnastics lesson with absolute strength. There is an important relation between muscular strength and movement performance as it is the factor from which movement results and it is the main factor for this movement that enables man to move, move a device, tool or any external resistance (5:256). Meanwhile, muscle contraction happens so quickly in the injury. The muscle or muscle group contracts by their maximum speed as a result of a very great number of muscle fibers, but the number decreases in maximum muscular strength (10: 127). All of the used tests measure the speed strength for muscles of arms and chest through the test of pressure from a standing position on the mat or hanging on the parallel bars with the use of (55 – 80%) of maximum intensity. The individual is also asked to repeat lifting as fast as possible within 10 seconds (1:86) and the adopted rehabilitation program contributed to strengthen operating muscles on the injured area because muscle stress and imbalance between the facing muscle group is one of the most important reasons leading to injury (6:90). In addition, the use of extension and contraction continuously during rehabilitation contributed effectively in recovery from injury that happened as a result of clear weakness in the joint (11:345).

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Annexes:

Annex (1)

A Survey of Experts' Opinions in the Rehabilitation Program

Weeks	Training Units	Serial	Exercises	Repetitions	Breaks between Repetitions	Time (Min)	Intensity	General Notes
First Week	First Unit	1	Opening and closing fingers consecutively	5	1 – 2 min	10-20 sec	55%	
		2	Sticking palms together – wrist bending of sides	5	1 – 2 min			
		3	Sticking palms together – wrists rotation rightwards – leftwards	5	=			
		4	Fingers together - wrists rotation outward	5	=			
		5	Fingers together - wrists rotation inward	5	=			
		6	Palms together – bending fingers inward	6	=			
		7	Palms together – bending fingers outward	6	=			
	Second Unit	1	Exercise (1) Unit (1)	6	=	55%		
		2	Sticking palms – wrist bending sideward together	6	=			
		3	Exercise (3) Unit (1)	7	3 2			
		4	Exercise (4) Unit (1)	7	3 2			
		5	Exercise (5) Unit (1)	7	=			
		6	Exercise (6) Unit (1)	7	=			
		7	Exercise (7) Unit (1)	7	=			
	Third Unit	1	Exercise (1) Unit (1)	7	=	60%		
		2	Exercise (2) Unit (2)	7	=			
		3	Exercise (3) Unit (1)	7	=			
		4	Exercise (4) Unit (1)	8	=			
		5	Exercise (5) Unit (1)	8	=			
		6	Exercise (6) Unit (1)	8	=			
		7	Exercise (7) Unit (1)	8	=			
Second Week	First Unit	1	Palms together – opening and closing fingers	8	3 – 4 min	20-30 sec	63%	
		2	Forearm on a table, wrist hangs outside the edge downwards, relaxing fingers, palm downward & hand bends downward as possible then upwards	8	3 – 4 min			
		3	Forearm on a table, wrist hangs outside the edge, palm toward board & straight fingers (hand rotation upward then downward)	10	=			
		4	Sitting with wrist on table (wrist rotation making hand back toward the table)	10	3 – 4 min			
		5	Wrist one-way rotation and then the other way	10	3 – 4 min			

	Second Unit	1	Exercise (2) Unit (1)	10	=	35-45 sec	65%	
		2	Exercise (4) Unit (1)	10	=			
		3	Exercise (5) Unit (1)	10	4 – 5 min			
		4	Forearm on table, wrist hangs outside the edge, palm downward, fingers pulled with consistency	12	=			
		5	Forearm on table, wrist hangs outside the edge, palm downward, fingers relaxed with bending hands as possible and consistency	12	=			
	Third Unit	1	Exercise (1) Unit (2)	12	=		65%	
		2	Exercise (2) Unit (2)	12	=			
		3	Exercise (3) Unit (2)	12	=			
		4	Exercise (4) Unit (2)	12	=			
		5	Exercise (5) Unit (2)	12	=			
Third Week	First Unit	1	Wrist rotation one direction then the other direction	14	3 – 4 min	35-45 sec	68%	
		2	Press on a small plastic ball	14	=			
		3	Touching thumb with the rest of fingers as possible touching palm top by tips of a single hand then making an angle by fingers	14	=			
		4	Forearm on table, wrist napping outside the edge, palm down, fingers relaxed, hand bending downward as possible then upward with holding a weight (2/1 pounds)	14	=			
		5	Forearm on a table, wrist hangs outside the edge, palm toward board & straight fingers (hand rotation upward then downward) with holding a weight (2/1 pounds)	14	=			
	Second Unit	1	Exercise (2) Unit (1)	14	=		70%	
		2	Exercise (3) Unit (1)	16	=			
		3	Exercise (4) Unit (1)	16	2 – 3 min			
		4	Exercise (5) Unit (1)	16	=			
		5	Holding a weight (2/1 pounds & consistency)	16	=			
	Third Unit	1	Exercise (4) Unit (1)	16	=		70%	
		2	Exercise (5) Unit (1)	18	=			
		3	Exercise (5) Unit (2)	18	1 – 2 min			
		4	Left wrist rotation with weight (2/1 pounds) and vice versa with right wrist	18	=			
		5	Wrists rotation rightward & leftward with weight (2/1 pounds)	18	=			
Fourth Week	First Unit	1	Holding a towel horizontally between hands making hands on each other, towel vertical then rotation backward & forward	18	=	25-35 sec	73%	

		2	Tying light weight (pound) on a rope tip then tying the other tip to a long stick, hold the post, palm down then raising the weight by bending wrists upward, then lowering weight by bending wrists down, repetition with palms up	18	60 – 90 sec			
		3	Hand contraction, extension then opening outward with the use of rubber band around fingers	18	=			
		4	Forward leaning – both palms forward – forearms bending & extending	20	=			
		5	Forward leaning on palms and fingers – forearms bending & extending	20	30 – 60 sec			
		1	Exercise (1) Unit (1)	20	=			
	Second Unit	2	Exercise (2) Unit (1)	20	=			75%
		3	Press on a tool to strengthen hand	20	=			
		4	Exercise (4) Unit (1)	20	=			
		5	Exercise (5) Unit (1)	20	=			
		1	Exercise (6) Unit (1)	15	=			
	Third Unit	2	Exercise (7) Unit (1)	15	20 – 50 sec			
		3	Holding weight (2/1 pounds) & consistency	15	20 – 50 sec			
		4	Left wrist rotation with holding weight (2/1 pounds) and vice versa with right wrist	14	20 – 50 sec			
		5	Wrists rotation together rightward – leftward with holding weight (2/1 pounds)	14	=			
	Fifth Week	First Unit	1	Exercise (1) Unit (1)	14			=
2			Exercise (2) Unit (3)	12	=			
3			=	12	=			
4			Forward leaning on forearms – bending & extending upper trunks	12	=			
5			Forward leaning on forearms – pressing arms from forearm to wrist	12	20 – 40 sec			
6			Pushing a wall with both arms then forward leaning (Chtaw)	10	=			
7			Forward leaning – palms facing each other – forearm bending & extending	10	=			
8			Forward leaning on palms – (Chtaw) with rising by palms tap on ground	10	=			

	Second Unit	1	Forward leaning- palms forward – forearms bending & extending	11	=		80%	
		2	Forward leaning on palms forward with fingers together – forearms bending & extending	11	=			
		3	Forward leaning on fingertips – forearm bending & extending	11	=			
		4	Exercise (3) Unit (1)	8	15 – 30 sec			
		5	Exercise (5) Unit (1)	8	=			
		6	Exercise (6) Unit (1)	8	=			
		7	Forward leaning on palms facing each other – forearms bending & extending	8	=			
		8	Chtaw with rising by taping palms on ground	7	=			
	Third Unit	1	Standing facing the wall, arm distance & pushing wall only with right arm	7	=		75%	
		2	Previous exercise with left arm	7	=			
		3	Previous exercise with both arms	6	20 – 50 sec			
		4	Leaning on a wooden bar	6	=			
		5	Hanging, leaning (arms bending & extending)	6	=			
		6	Exercise (5) Unit (1)	5	=			
		7	Exercise (6) Unit (1)	5	=			
8		Exercise (7) Unit (2)	5	=				
Sixth Week	First Unit	1	Hanging on horizontal bar	6	30 – 60 sec		65%	
		2	Standing – swinging of arms consecutively holding a weight	6	=			
		3	Previous exercise	7	=			
		4	Lying down, wrist rotation with dimple	7	=			
		5	Lying down, pushing ground by palms and immediate rising	4	40 – 70 sec			
		6	Hanging (arms bending & extending)	4	=			
		7	Forward leaning on forearms – pressing arms from forearm to wrist	4	=			
		8	Pushing a wall by both arms then down and forward leaning	6	=			
	Second Unit	1	Hanging on horizontal bar – forward leaning (arms bending & extending)	6	30 – 60 sec		65%	
		2	Forward leaning on forearms – pressing on forearms to the wrist	6	=			
3		Standing facing the wall – pushing the wall by arms then	8	=				

			down to forward leaning					
		4	Exercise (4) Unit (1)	8	=			
		5	Exercise (5) Unit (1)	8	20 – 50 sec			
		6	Exercise (6) Unit (1)	10	=			
		7	Left wrist rotation with holding a weight (2/1 pound) and vice versa with right wrist	10	=			
		8	Wrists rotation rightward – leftward with holding a weight (2/1 pound)	10	=			
	Third Unit	1	Standing facing the wall on an arm distance – pushing arm by right arm	10	=		60%	
		2	Previous exercise – left arm	12	15 – 40 sec			
		3	Previous exercise – both arms	12	=			
		4	Skewed leaning on a wooden bar	12	=			
		5	Hanging on horizontal bar (arm bending & extending)	8	=			
		6	Exercise (2) Unit (2)	8	=			
		7	Exercise (3) Unit (2)	8	=			
		8	Forward leaning of palms facing each other & wrists bending & extending	8	=			