The Effect of a Rehabilitation Program Accompanied by Karo-Proketic to Rehabilitate the Injury of Minor Rupture of The Rectus Muscles in The Lumbar Region for Sitting Volleyball Players

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ABSTRACT

The aim of this study was to examine whether or not a cardiopulmonary rehabilitation program is effective in treating rectus muscle injuries in the lumbar region among volleyball players who have a tendency to sit for extended periods of time due to their sport. Pre- and post-tests were administered to the same group of volunteers who participated in this research. The study was an experiment. An experimental approach was used in the design of the investigation. At the sports competition that took place in 2024-2025, the individuals who took part in this research were members of the disabled sitting volleyball team that participated for the Anbar governorate. This analysis was carried out with the help of the SPSS software. According to the findings, the player's ability to bend forward and backward was significantly improved as a consequence of the rehabilitation exercises that were carried out. In the lumbar region, those people who had partial rips in the rectus muscle improved greatly from this practice. As a result of this, the researchers came up with the recommendation that these exercises should be maintained in order to either prevent new injuries from occurring or to improve ailments that were already existing.

1. Introduction

Spinal injuries have become a prevalent problem among people of all ages, including children, women, and men.Cardiopulmonary Rehabilitation is one of the most important methods that is used in the treatment of spinal injuries. This treatment does not involve any side effects as a result of its use, and it can be used for people of all ages and stages, as well as for a wide variety of injuries. The goal of this treatment is to achieve the highest possible level of rehabilitation for both sports and non-sports injuries, and to return them to their normal state. In the field of sports that treats and rehabilitates sports injuries, such as lumbar spine injuries that affect the output of muscle strength and range of motion of the injured player, as well as volleyball games, which include able-bodied and disabled athletes sitting, sports qualification is considered to be an important aspect of the field. In Anbar province, one of the latest activities that is available to people with disabilities is sitting volleyball. The sport of volleyball for the handicapped is one of the sports that need the spine to be protected while it is being performed. This is because the spine is subjected to a significant load, particularly on the lumbar vertebrae, which demands a significant amount of muscular strength and a broad range of movement. As a result, these practices and their prevalence have a negative impact on the injury of the lumbar vertebrae, which results in a throbbing sensation in the muscles that surround the lumbar vertebrae[1]. This, in turn, has a negative impact on the movement of the spine. As a result, the researcher made the decision to investigate this specific injury in order to facilitate the return of players to the stadiums and to speed

up their rehabilitation. This was accomplished through the utilization of rehabilitation exercises in conjunction with cardiopulmonary therapy. The goal was to return players to the stadiums in the shortest amount of time possible without causing them to experience the same injury again. This is where the significance of research lies. As a result of the researcher's frequent visits to the physiotherapy center, he or she became aware of the presence of a number of individuals who had suffered spinal injuries and an exacerbation of low back pain. Furthermore, the researcher discovered, after reviewing a wide range of sources and scientific programs, that this issue is experienced by a large number of athletes at varying ages and times, specifically the injury of the lumbar vertebrae. It was confirmed by the researcher's observation and the initial detection of the team members about the presence of that injury that the lumbar vertebrae were affected by the muscular rupture of the rectus muscles in that lumbar region. This was due to the fact that the injury was ignored or not detected early in order to prevent its recurrence and aggravation. Because of this, the researcher decided to investigate this injury because it is of great significance for players when they are playing volleyball while sitting. This injury can be treated by providing rehabilitation exercises that are accompanied by chiropractic care, and it can be determined according to an appropriate time period that contributes to the return of injured players to the stadiums for a minimum amount of time.In order to recover the lumbar spine injury that sitting volleyball players often have, the study attempted to develop a rehabilitation program and determine the effect that it would have with chiropractic treatment.

Research methodology and field procedures

Research methodology

The two researchers adopted the experimental approach by designing a one-group system with two Tests before and after, for its suitability and the nature of the research problem .

Community and sample research

The research community was selected by the intentional method, consisting of the Anbar Governorate national team for the disabled sitting volleyball, and the research sample included the intentional method of injured players in the lumbar region with partial rupture of the rectus muscles according to the diagnosis of the specialist doctor*, which amounted to (4) injured.

Method of conducting research

By watching some matches and exercises of the Anbar national team for the disabled sitting in volleyball, for the purpose of obtaining a research sample, and through their petition, the two researchers explained in detail to the players about the injury to the lumbar spine area, where this injury impedes the player's movement, and how to rehabilitate from this injury, where he met with satisfaction from the players, especially the injured, and they were registered and an appointment was scheduled for a clinical examination by a specialist doctor and then the two researchers conducted field experiments as follows .

The first reconnaissance experiment

The two researchers conducted their survey experiment on (Tuesday)corresponding to(2/1/2024) on a sample of (4) players from the Anbar national team for the disabled sitting in volleyball at hit General Hospital-Anbar, with the presence of the auxiliary work team. To find out how the used device

performs and its validity during its application to the research sample, as the device was shown before the performance to a group of specialists*,

the aim of this experiment was to :

1-knowledge of the mechanism of operation of the device and its validity.

2-know the indicators that can be measured by the device.

The second reconnaissance experiment

The two researchers conducted their second exploratory experiment, accompanied by the specialist doctor and the assistant team, on Wednesday (10/1/2024) at hit General Hospital-Anbar, where the purpose of conducting exploratory experiments in relation to the device (measuring the degree of curvature of the lumbar vertebrae), which was conducted on one of the members of the research sample[2].

The third reconnaissance experiment

The two researchers conducted the third exploratory experiment on (Thursday), corresponding to (11/1/2024), accompanied by the assistant work team in (the closed hall of the hit Youth Forum) Anbar to do the following:-[3]

1-knowing the adequacy of the assistant work team and its duties during the exercise in the correct form.

2-knowledge of the validity of the qualifying tools and means used in the research.

3-identify how to organize the rehabilitation exercises, their sequence and the appropriate times to implement them.

Tests used for the innovative device in research

First Test: Forward Bending Test

- **Test Name:** Forward Range of Motion Test for Lumbar Vertebrae
- **Purpose:** To measure the degree of forward curvature in the lumbar vertebrae.
- **Mechanism:** This test is conducted with the participant wearing a back belt equipped with sensors. These sensors are housed in a box attached to the belt, which measures the forward curvature of the lumbar region. The results are displayed on a screen linked to the box.
- **Recording:** The curvature degrees shown on the screen are recorded, indicating how far the lumbar region can bend forward[4].

Second Test: Backward Bending Test

- **Test Name:** Back Range of Motion Test for Lumbar Vertebrae
- **Purpose:** To measure the degree of backward curvature in the lumbar vertebrae.
- **Mechanism:** Similar to the first test, this involves wearing a back belt with sensors in a box that measures the degree of backward curvature of the lumbar region. The results are displayed on an attached screen.
- **Recording:** The readings displayed on the screen are recorded, reflecting the extent of the lumbar region's backward bend[4].

The pre-tests

The researchers conducted the pre-test on Tuesday, January 16, 2024, at 4:00 PM, with the assistance of the support team. The tests involved measuring the degree of lumbar vertebrae bending among the sample participants, who wore the (innovative device) in the enclosed hall belonging to (the Hit Youth Forum)[5].

The main experiment

The researchers, after reviewing several related sources and consulting various experts in sports medicine and training fields, chose specific exercises that matched the research requirements and were suitable for the study sample. Following the pre-tests, the main research experiment was implemented on Monday, January 22, 2024, and lasted for two months. It involved rehabilitation exercises, consisting of (27) exercises that all participants in the study sample underwent. The study administered (16) rehabilitation sessions spread over (8) weeks, with (2) sessions per week, specifically on Mondays and Thursdays. The exercises were carried out by the coach and the support team, primarily in the main section of the rehabilitation unit and in its initial part immediately after the warm-up, concluding with the last session on Monday, March 25, 2024.

The rehabilitation units included exercises and tools prepared by the researchers, distributed across the units in a scientifically planned manner to achieve the objectives of each session[6].

Important points to consider before starting the rehabilitation exercises include:

1. Performing the exercises individually or in groups, depending on the type of exercise and the study sample.
2. Gradually increasing the difficulty of the rehabilitation exercises from easy to hard.
3. All exercises should be performed within pain limits.

The post-tests

The researchers conducted the post-test on Wednesday, March 27, 2024. They adhered to the same procedures and conditions used during the pre-test, ensuring consistency in terms of timing and location [7].

Statistical Tools

The statistical package (SPSS) was used to extract and statistically process the results.

Presentation, analysis and discussion of results

presentation and analysis of the results between the pre-and post-tests of the study variables of the research sample.

Table 1: Statistical Analysis of Forward and Backward Bending Tests

Variables	Test	Mean	Std. Deviation	Mean Difference	Std. Deviation Difference	T-test	Sig. (2-tailed)	Significance

Forward Bending	Pre-test	72.75	4.573	8.5	5.0	3.4	0.042	Significant
Forward Bending	Post-test	78.5	1.291					
Backward Bending	Pre-test	6.25	1.708	4.0	2.160	3.7	0.032	Significant
Backward Bending	Post-test	9.75	0.957					

***Significant if the level of significance is less than or equal to the error rate.**

The table shows that there were significant statistical differences between the pre-test and post-test for all variables, favoring the post-test:

- **First Test**: The calculated T-value is 3.4 under a significance level of 0.042. Since the significance level is below the error threshold (0.05), it indicates a significant improvement in the post-test for forward bending.
- **Second Test:** The calculated T-value is 3.7 under a significance level of 0.032, also indicating a significant improvement in the post-test for backward bending.

The first Test achieved morale by using rehabilitation exercises of a physical nature with intensity according to the degree of pain, so the researcher attributes the positivity of that result to the nature of the exercises that take into account the psychological, physiological and dynamic aspects of the injured while performing those exercises that were characterized by those qualities, and this is confirmed by Ammar Hamza Hadi that the rehabilitation exercises and the muscles surrounding the affected area, as for the dynamic trait, which means the occurrence of movement and flexibility in those It came as a result of the use of rehabilitation that has a direct effect on the injury site, raising the muscular capacity of the chock muscles and reducing the degree of pain and recurrence of the injury, and this is what (raissan khoribet 1989)[8]. that the body is composed of parts, and the more the Centers of gravity of these parts fall perpendicular to each other, this body has proven and its ability to achieve the ability to balance strength when performing better [9]. As the researcher attributes this improvement to the age factor, the stage of skeletal ossification, etc it plays a negative impact on the process of correcting deformities or injuries of the spine who are practicing This is consistent with the statement (Mohamed Sobhi Hassanein and Abdessalam Ragheb, 1995)[10]. that the early detection of deformities or injuries makes it easy to treat them using physical exercises appropriate to the injury and its degree[10].

2. Conclusion and future scope

Through the results of the research, it appeared that there is a positive effect of exercise in improving the forward and backward bending of players with partial rupture of the back muscles in sitting volleyball, as well as the program prepared by the researchers was suitable for the research sample with all its components.

Recommendations

The researchers recommend continuing to perform the exercises used for the purpose of prevention and to prevent recurrence or aggravation of the condition or injury, as well as to ensure the safety and

security of the players through regular disclosure to them.

Reference

1.B. M. Khalil, "The Impact of a Proposed Aquatic Rehabilitation Program Accompanied by Therapeutic Exercises on Patients with Lower Back Pain," Unpublished Master's Thesis, Helwan University, 2009, p. 2.

2.A. H. Hadi, "Rehabilitation of Injuries," Babylon University, College of Physical Education and Sports Science.

3.O. W. Shehab, "Testing and Measurement," Diyala University, College of Physical Education and Sports Science.

4.L. Z. Mseikh, "Physiology of Sports Training," University of Anbar, College of Physical Education and Sports Science.

5.A. F. Omar, "Sports Training," University of Anbar, College of Physical Education and Sports Science.

6.S. M. Ali, "Technological University, Department of Biomedical Medicine."

7.A. M. Dawood, "Technological University, Department of Biomedical Medicine."

8.R. Khreibet, Encyclopedia of Measurements and Tests in Physical Education and Sports, Basra: Higher Education Printing Press, 1989.

9.A. H. Hadi, "Personal interview," University of Anbar, College of Physical Education and Sports Science, Anbar, Iraq, 10:00 AM, Feb. 25, 3024.

10.M. S. Hassanein and A. S. Ragheb, Proper Posture for All, 1st ed., Cairo: Dar Al-Fikr Al-Arabi, 1995.