The effect of rehabilitation exercises on lower back pain and the accuracy of shooting with the 10m air pistol for shooting players

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Introduction and importance of the research:

The role of sports in the modern era is not limited to just participating in competitions, but the interest in practicing sports activity in both developed and developing societies has become a basic manifestation of human development in order to improve human health, and sports have become a common denominator in the advice given by doctors to prevent Diseases that may afflict humans at different stages of life, and among the injuries and physical problems that are related to high effort, poor physical fitness and physical construction are back injuries, including lower back pain in shooting players.

Rehabilitation exercises are the main focus and the common factor in treating injuries and are one of the most important ways to remove cases of muscle and joint dysfunction, as well as interest in understanding the (biomechanical) movements of the body and proper posture through performing exercises to develop muscle strength, joint flexibility and the degree of neurological compatibility to restore the normal state of the back.

The aids in the rehabilitation exercises play an important role, as the researcher will use hospital aids and aids in exercises such as the medicine ball and others, and the main objective of these means is to help the player gain full recovery in the fastest time and in the best way, lower back pain usually occurs In shooting players, most of the practitioners of these activities complain of pain in the lower back as a result of the pressure caused by intense training for long periods, especially during the performance of basic exercises, and because of the weakness of the muscles in the lower back and because of some daily habits, and these pains usually result from acute or chronic injuries that affect their structures. In the joints or some of them (cartilage, bones, ligaments, muscles and nerves).
Hence the importance of research in developing a rehabilitation program using aids to rehabilitate and heal lower back pain for air pistol shooting players because of the importance of this problem in helping the players perform their daily training and duties, endurance performance, raise the physical readiness and bring the player to a higher level of achievement by improving. Accuracy of shooting and endurance in general and special.

**The research aims to:**

1- Preparing rehabilitation exercises in lower back pain and the accuracy of shooting with the air pistol for shooting players.

2- Identifying the effect of rehabilitation exercises on lower back pain and the accuracy of shooting with the air pistol for shooting players.

- **Search procedures:**

  - Research Methodology: The researcher used the Experimental Method (experimental design with a single experimental group with pre- and post-test, as it is the appropriate way to solve the problem

  - Research community and sample: 10m air pistol shooting players.

As for the research sample, it consisted of (8) shooting players who have lower back pain, as (2) players were excluded due to their inability to adhere to the application of the qualifying program and the fact that they were subjected to the exploratory experiment, so that the final sample number was (6) players.

As for the exploratory experiment sample, it consisted of (2) and they were excluded from the main experiment as mentioned previously.

**Table (1)**

Shows the experimental design of the research

<table>
<thead>
<tr>
<th>The method of conducting the test</th>
<th>The experimental program</th>
<th>The method of conducting the test</th>
<th>The group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-tests</td>
<td>Use of qualifying exercises with aids</td>
<td>Pre-test</td>
<td>experimental group</td>
</tr>
</tbody>
</table>
- Means, tools and devices used in the research.

Sources and references.

Questionnaire.

- Interviews.

- Note

- stopwatch.

Dell computer.

- medical adhesive tape

Two (2) rubber bands

65cm rubber rehabilitation ball

- Medicine ball (2) kilo number ((1 .)

- Foam roller, pcs. (2)

- Air pistol 10m number 6)).

4.5 mm gear.

Shooting targets.

Field research steps and procedures:

Pain assessment form:

The researcher measured the degree of pain level in the sample by designing a special form similar to what is in place in the World Health Organization, with modification to it to suit the study of the research after it was presented to experts and specialists to reveal information about the degree of pain according to different situations and angles carried out by the player. The form contains Degrees from 1 to 7, where 1 represents the lowest degree of pain and 7 represents the most severe pain (determining the movement of the affected limb)
<table>
<thead>
<tr>
<th>Name</th>
<th>No.</th>
</tr>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>After</th>
<th>Before</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain degree (1-7)</td>
<td>Pain degree (1-7)</td>
</tr>
<tr>
<td>Angled movement pain</td>
<td>Angled movement pain</td>
</tr>
<tr>
<td>Pain when pressing on the area</td>
<td>Pain when pressing on the area</td>
</tr>
<tr>
<td>Rest pain</td>
<td>Rest pain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th>Pain degree (1-7)</th>
<th>Pain when pressing on the area</th>
<th>Rest pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>90</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<td>3</td>
<td></td>
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<td>4</td>
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<td>5</td>
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<td>6</td>
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<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8</td>
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<td></td>
<td></td>
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<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td></td>
<td></td>
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</tbody>
</table>
Pain determination form

Air pistol shooting accuracy test

Purpose of the test: To measure the shooting accuracy of the air pistol

Testing tools: air gun, stationary paper targets

Performance description:
1- The shooter stands on the scoring line facing the fixed target
2- The shooter carries the weapon and performs all the technical requirements required for performance
3- The shooter shoots at the target and then shoots at the center of the target
4- 10 shots are given to each shooter
5- The shooter must throw all 10 shots

Recording method: The result is calculated for the ten shots, by calculating the values of the launches according to the marks of the holes that hit the target, as the best value of the launch is (10) points that are thrown at the center of the target, and the farther the launch is from the center of the target, its value decreases gradually and decreasing, meaning that it is The maximum value of the total shot is 100 points

Final score: The final score is extracted from the sum of the 100 points

Survey experience:

Experimental research measurements:

The exploratory experiment was conducted on Saturday, 3/4/2021 at ten in the morning, on a survey sample of players who had lower back pain and who were excluded from the main experiment due to their inability to communicate and continue with the research procedures. The exploratory experiment aimed to find out.
• The extent of the patients' ability to apply therapeutic exercises.
• The suitability of the exercises and their gradation from easy to difficult to prepare the qualifying program for the main sample.
• The validity of the tests for the sample.
• Getting to know the assistant staff
• The validity of the devices used in the current study and the extent of the research sample's understanding of the tests and measurements used.

The exploratory experience of the pilot method:
A special qualifying session was conducted for (2) players who have lower back pain, on Tuesday (6/4/2021), and at exactly (11:20) a.m. in Khawla Bint Al-Azwar Square in the Central Iraqi Federation. For shooting to ensure their ability to apply the qualifying sessions and exercises, and the extent of the sample's ability to implement the vocabulary of the prepared qualifying curriculum, as well as discovering the difficulties facing the researcher during the application of the curriculum, and the results of this experiment resulted in the suitability of the program to the research sample and their ability.

Pre-test:
The researcher conducted tribal tests on the research sample of (6) players who represented the experimental group, on the corresponding Saturday and Sunday 11-10/4/2021 and lasted for two days at exactly nine o'clock in the field (Khawla Bint Al-Azwar) in the Iraqi Central Shooting Federation. The results of measuring tests and the results of measuring the degree of pain among the players were recorded, as well as the results of the shooting accuracy test were recorded on the next day, and the researcher gave A brief explanation of how the tests were performed and their sequence, and the researcher established all the conditions for measurements and tests in terms of (time, place and climate) to be able to create similar or close conditions when conducting post tests.
The main experience:

The researcher prepared rehabilitation exercises with aids to improve the effectiveness of the lower back area for players who have lower back pain, based on some sources and scientific research related to rehabilitation, as well as the opinion of the supervisor and some experts and specialists in the field of rehabilitation and sports medicine. The exercises were divided into weeks of the rehabilitation program used.

The main experiment of the experimental group started on Saturday, 4/24/2021 until 24/6/2021. The players attended the (Khawla Bint Al-Azwar) field in the Iraqi Central Shooting Federation Baghdad, after which the qualifying exercises prepared by the researcher are performed. A special calendar was prepared to write everything related to the daily training carried out by the participants in the experimental group. The rehabilitative exercises began using low-intensity training and began to gradually escalate depending on the intensity, and the repetitions were determined depending on the ability of the injured, and the time period for the total repetitions was also recorded to benefit from them in knowing the time of each repetition, and the researcher has adopted the feeling of fatigue as an indicator to determine the periods of intermittent rest.

The total duration of the program was (8) weeks and each week contains three qualifying sessions during Saturdays, Mondays and Wednesdays, where the total number of qualifying sessions is (24) qualifying sessions.

The session included a variety of rehabilitation exercises (general flexibility exercises for the back, lateral flexibility exercises, strength endurance exercises and strength exercises), using rehabilitation aids to help the large medical ball, the small heavy medical ball, the rubber band and the foam cylinder, as well as the use of medical adhesive tape because it has an auxiliary and important role in modern rehabilitation. It works on muscle relaxation and increases blood flow to the lower back muscles, in addition to several functions.

Post-test:

After completing the implementation of the qualifying curriculum, post-tests were conducted on the research sample on Wednesday (30/6/2021 at exactly nine o'clock in the morning) in the field (Khawla Bint Al-Azwar) in the Iraqi Central Shooting Federation Baghdad. Measuring the shooting accuracy.
Statistical means:

The researcher used the Statistical Package for the Social Sciences SPSS, which is a special mathematical program to extract the statistical results of the research of the College of Physical Education and Sports Sciences.

- Arithmetic mean
- Mediator
- Quartile deviation
- Skew modulus
- Vein
- Man Whitney

Presentation, analysis and discussion of the results:

This section included the presentation of the results for the pre-tests and the post-tests for the research sample. These results were analyzed and discussed for the purpose of reaching the objectives of the research and verifying the validity of the hypotheses.

Non-parametric statistics were used for the interconnected and independent samples to know the significance of the differences for the arithmetic circles, and to verify the effect of using qualifying exercises by means of assistance. In improving the effectiveness of the lower back and the accuracy of shooting among the research sample.

Presentation of the results of pre and post measurements of lower back pain:

For the purpose of verifying the (first) hypothesis, the researcher analyzed the tribal and posterior research data for the experimental group using the Wollcoxon test for correlated samples to reach the significance of the differences between the two measurements, as shown in Table (2).

Table (2)

It shows the median, interquartile deviation, and Wilcoxon value for the studied pain variables in the pre and post measurements.
<table>
<thead>
<tr>
<th>significance</th>
<th>Value sig</th>
<th>Wollcozen value computed</th>
<th>Vernal deviation</th>
<th>After mediator</th>
<th>Vernal deviation</th>
<th>Before mediator</th>
<th>Unit of measure</th>
<th>Changes</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorporeal</td>
<td>0.05</td>
<td>1.89</td>
<td>.75277</td>
<td>1.1667</td>
<td>1.26491</td>
<td>3.0000</td>
<td>Degree</td>
<td>Pain with rest</td>
<td></td>
</tr>
<tr>
<td>Incorporeal</td>
<td>0.02</td>
<td>2.33</td>
<td>.75277</td>
<td>.8333</td>
<td>.89443</td>
<td>2.0000</td>
<td>Degree</td>
<td>Pain with pressure</td>
<td></td>
</tr>
<tr>
<td>Incorporeal</td>
<td>0.01</td>
<td>2.89</td>
<td>.51640</td>
<td>.6667</td>
<td>.54772</td>
<td>2.5000</td>
<td>Degree</td>
<td>Pain at an angled of 30 degree</td>
<td></td>
</tr>
<tr>
<td>Incorporeal</td>
<td>0.02</td>
<td>2.39</td>
<td>.51640</td>
<td>1.3333</td>
<td>.54772</td>
<td>3.5000</td>
<td>Degree</td>
<td>Pain at an angled of 60 degree</td>
<td></td>
</tr>
<tr>
<td>Incorporeal</td>
<td>0.02</td>
<td>2.66</td>
<td>.63246</td>
<td>2.0000</td>
<td>.51640</td>
<td>4.3333</td>
<td>Degree</td>
<td>Pain at an angled of 90 degree</td>
<td></td>
</tr>
</tbody>
</table>
The graph that shows the mean and quartile deviation of the studied pain variables in the pre and post measurement. It is evident from the above table that all values of the test error rate are less than the level of statistical significance (0.05), which means that there are significant differences in all the variables investigated in favor of the dimensionality.

Discussing the results of the pre and post measurements of the degree of pain variable:

The researcher attributes the development that occurred between the tribal and remote tests of the experimental group in the variable degree of pain, and that the therapeutic exercises prepared by the researcher in the program included in a diversified manner with regular exercises and proposed to increase and improve the motor range of the lower back and get rid of pain with all its variables, which targeted the flexibility of the joint and muscles, and these exercises led to the occurrence of A significant and noticeable improvement in his mobility, as well as an increase in the physical and functional efficiency of the injured, which increased their ability to perform rehabilitation exercises smoothly and in a wide range, and this was confirmed by the results.
The researcher agrees with what was mentioned (Osama Riyad 1999) (that flexibility exercises have a direct effect in eliminating pain and adhesions and lead to obtaining the full range of joint movement) (1).

Bullough (1993) states that the most important goals of rehabilitation exercises are to relieve and eliminate pain, as pain is one of the common symptoms of injury and has a direct impact on movement impairment, for which the joint is responsible, and this is what the proposed rehabilitation exercise program has achieved (2). Magdy Mahmoud and Cook (1996) (3) and Tariq Muhammad Sadiq (1996) (4) indicate that rehabilitative exercises work to restore the range of motion of the joint, increase muscle strength and get rid of pain, as confirmed (5) (American Pain Foundation) However, exercise is a common method in rehabilitation programs to treat pain, as it not only maintains health, but also helps relieve pain all the time. Physical activities help control joint pain and swelling as a result of joint inflammation.

Zaki Hassan (2004 AD) (6) emphasized that rehabilitative exercise programs have a positive impact on reducing injury and relieving pain, and that the use of exercises increases the range of motion of the joints, removes contractures, eases the movement of joints, removes pain and works to relax and activate the muscles related to it.

He pointed out that exercises to develop endurance of muscle strength and flexibility are among the most important exercises that must be included in the rehabilitation exercise programs, because of their positive impact on reducing and mitigating injury. This is what was included in the proposed rehabilitation exercise program, and these reasons had a clear and effective positive impact on the group in improving the effectiveness of the lower back area.

And this is what becomes clear to the therapeutic exercises, those exercises that work to rehabilitate motor muscle injuries as well as to renew the functional state of the affected organ. The research that says there is an effect of rehabilitation exercises with the chosen aids according to the therapeutic approach in the research sample in the pre-tests, including in the post-test.
- Presentation of the results of the shooting accuracy test in the tribal and dimensional measurements of the experimental group

Table (3)

It shows the median, quartile deviation, and Wilcoxon value for the accuracy of aiming the air pistol in the tribal and remote measurements.

<table>
<thead>
<tr>
<th>significance</th>
<th>Value sig</th>
<th>Wollco xen value computed</th>
<th>Vernal deviation</th>
<th>After mediator</th>
<th>Vernal deviation</th>
<th>Before mediator</th>
<th>Unit of measure</th>
<th>Changes</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorporeal</td>
<td>0.01</td>
<td>2.57</td>
<td>2.33</td>
<td>92.66</td>
<td>7.67</td>
<td>75.50</td>
<td>degree</td>
<td>accuracy</td>
<td></td>
</tr>
</tbody>
</table>

The graph shows the mean and the quartile deviation to measure the accuracy of shooting a pistol in the tribal and remote measurements.

**Conclusions and Recommendations:**

Through field research procedures and statistical equations, the results of the research showed a set of conclusions and recommendations, which are:

**Conclusions:**
1- Rehabilitative exercises have a positive role in improving and rehabilitating lower back pain.

2- Rehabilitation exercises have a positive role in developing the accuracy of air pistol shooting.

Recommendations:

1- Using rehabilitation exercises to rehabilitate lower back injuries for all activities and sports because they have a role in the rehabilitation of the athlete.

2- Conducting more studies and scientific research to identify the effectiveness of applying rehabilitation exercises to common injuries.

3- The necessity of conducting educational rehabilitation courses for players and coaches and for various games and sports.

Sources

- Osama Riad: Physiotherapy and Rehabilitation of Athletes, Dar Al-Fikr Al-Arabi, Cairo, 1999.

- Magdy Mahmoud and Cook: A proposed program to rehabilitate the muscles working on the shoulder after repairing recurrent dislocation, Ph.D. thesis, Faculty of Physical Education, Tanta University, 1996.


- www. American Chronic Pain Association. com