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The effect of a physical rehabilitation program on rotator cuff injuries among Al-Nasiriya Club boxers aged 14-16 years

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Abstract
The research problem lies in the scarcity of studies focusing on upper limb injuries, such as shoulder joint, tennis elbow, and rotator cuff injuries, among boxers. This led the researcher to study rotator cuff injuries, a common and significant problem affecting boxers, impacting their athletic performance and increasing the risk of absence from competitions. Among the factors contributing to this injury, weakness in the rotator cuff muscles stands out as a primary cause of shoulder joint instability. This leads to disturbances in the biomechanics of the upper limb, increased mechanical load on the elbow and wrist joints, and consequently, a higher injury rate in these areas. The research aims to develop a physical rehabilitation program to address rotator cuff muscle weakness in boxers in Dhi Qar Governorate and to identify the program's impact on improving muscle function in these boxers. The researcher employed a single-group experimental design, deemed suitable for the nature of the research. The study population and sample were selected purposively, consisting of 12 boxers with rotator cuff injuries. The researcher concluded by developing a physical rehabilitation program to address muscle weakness. The rotator cuff and the rehabilitation program contributed to the development of certain physical variables in boxers.

Keywords: rehabilitation program – rotator cuff

Introduction

Boxing is a sport involving direct contact with a training partner or an opponent in a competitive match, and sometimes with individual training, such as punching on a punching bag or imaginal boxing. Various injuries occur in the upper extremities more frequently than injuries to the core and lower extremities. This makes the presence of rehabilitation specialists essential within the training and administrative staff, as they bear a great responsibility to be experienced in the field of sports medicine and medical rehabilitation through their participation in specialized scientific conferences, workshops, and seminars. If sports injuries are not addressed with the correct scientific approach, they can lead to several possibilities, including recurrence of the injury or the development of a chronic injury, which shortens the athlete's career. Therefore, when we observe boxing matches, after any injury resulting from strong punches, the specialist examines the injured athlete. The decision to continue the match or end it depends on their assessment of the severity of the injury for the athlete. The importance of this study lies in addressing a common injury among boxers and providing practical solutions aimed at improving athletic performance and reducing the rate of injuries. This research also contributes to bridging the gap in understanding the impact of rotator cuff weakness on adjacent joints. This may help coaches and sports therapists design more effective training and rehabilitation programs. The researcher proposes a rehabilitation approach incorporating physical therapy techniques to address rotator cuff and shoulder joint injuries, as well as restore strength to athletes, facilitating their return to their favorite sport with maximum efficiency and minimal time and effort.

Research Problem: Identifying problems in terms of their causes and treatment is a scientific approach to resolving complexities and achieving desired goals, such as reaching the highest levels in sports. Upon reviewing previous and similar studies, the researcher observed a scarcity of research focusing on upper limb injuries, such as shoulder joint, tennis elbow, and rotator cuff injuries in boxers. This led the researcher to conduct a study on rotator cuff injuries, a common and significant problem faced by boxers, affecting their athletic performance and increasing the risk of absence from competitions. Among the factors contributing to this injury, weakness in the rotator cuff muscles stands out as a primary cause of shoulder joint instability. This leads to disturbances in the biomechanics of the upper limb, increased mechanical load on the elbow and wrist joints, and consequently, a higher rate of injuries in these areas. Therefore, the researcher decided to develop a physical rehabilitation program to address rotator cuff injuries in boxers.

Research Objectives

1. To develop a physical rehabilitation program to address rotator cuff muscle weakness in boxers in Dhi Qar Governorate.
2. To identify the impact of a rehabilitation program on muscle weakness in boxers in Dhi Qar Governorate.

Research Hypothesis : There is a positive impact of the proposed program, which includes physical rehabilitation programs, on rotator cuff injuries in boxers in Dhi Qar Governorate.

Research Scope

- Human Scope: (12) boxers from various clubs in Dhi Qar Governorate.
- Time Scope: From May 3, 2024, to July 5, 2025.
- Location: The clubs targeted in the research in Dhi Qar Governorate are (Al-Nasiriyah Sports Club, Tishreen Sports Club, Youth and Sports Forum, and Al-Furat Sports Club) (Boxing Hall at the Youth and Sports Forum in the Sumer neighborhood).
- Definition of Terms: - Definition of rotator cuff and its injury: - It is a small muscle located in the shoulder that surrounds the joint. The main function of these muscles is to provide complete stability during joint movement. They are a group of tendons and ligaments that connect the shoulder bones to its muscles. They keep the upper part of the arm inside the shoulder cavity and give you the strength and movement to rotate and raise the arm.

Research Methodology: The researcher used the single-group experimental method, as it was suitable for the nature of the research. Experimental research is considered the most accurate type of scientific research, capable of influencing the relationship between the independent and dependent variables in the experiment.

Research Population and Sample

The research sample was selected from boxers with mild to moderate rotator cuff injuries within clubs in Dhi Qar Governorate accredited by the local boxing federation. Twelve boxers with rotator cuff injuries were chosen, representing 100% of the research population.

Table (1) shows the homogeneity of the sample.

Skewing coefficient	Standard deviation	Meaning	Arithmetic mean	Unit of measurement:	Variables
0.372	2.289	175	175.714	cm	Height
0.010	1.414	64	64	kg	Weight
0.353	0.900	15	14.857	year	Age
-0.277	0.976	4	3.571	year	Training Age

The homogeneity of the research variables is shown

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Twisting	Deviation	Medium	Middle	Unit of measurement:	Variables		No
0.732	0.819	0.467	3.600	3.724	kg	Explosive power of the arms	1
0.655	1.988	59	59.571	degrees	Shoulder flexion	Rank joint range of motion	2
-0.372	2.289	82	81.286	degrees	Shoulder dimension		
-0.249	1.113	25	24.714	degrees	Shoulder extension		
-0.352	1.345	25	25.143	degrees	Shoulder external rotation		
-0.964	1.260	37.840	37.484	cm	Flexibility for the shoulders		3

Table (3) shows the number of experts, percentages, chi-square value, and significance level for the physical research variables.

Semantic meaning	Chi²	Percentage	Disagree	Agree	Number of experts	Physical variables	N
Semantic	8	%100	0	8	8	Explosive power of the arms and shoulders	1
Semantic	6.12	%87.5	1	7	8	Shoulder flexibility	2
Non-semantic	3.12	%37.5	5	3	8	Performance speed	3
Non-semantic	3.12	%37.5	5	3	8	Punching power of the arm	4
Non-semantic	3.12	%37.5	5	3	8	Arm trajectory	5
Semantic	6.12	%87.5	1	7	8	Rank joint range of motion	6
Non-semantic	2	%50	4	4	8	Strength endurance of the arms	7

The Experimental Physical Training Program: Detailed Plan:
General Information about the Training Program - Total Duration: 12 Weeks
Week 1 Sample
Week 1:

Rest between exercises	Rest between repetitions	Repetitions	Performance time or repetitions	Exercise Explanation and Performance Method:	Exercise Name: Light Shoulder Warm-up	No
				The player stands upright and raises both arms upwards to shoulder level from below, moving them sideways in a gentle fluttering motion (butterfly movement). This is done fifteen times to prepare the shoulder for the exercise.	Shoulder Muscle Stretch	1
60sec	30sec	3×	Hold for 15 seconds	The injured player stands in a stable and still position and raises both arms to the sides without weight, starting from the side adjacent to the leg. The arm is raised until it reaches a level that restricts the injured part, at which point it stops. This movement is repeated very slowly to release tension in the muscle fibers, ten times per session.	(Air Flap)	2
60sec	30sec	3×	Hold for 15 seconds	From a standing position, the injured player raises the injured arm in front of the face. The player then raises the arm alternately to the right and then to the left, starting from the bottom and moving upwards until it reaches nose level. The arm is held for two seconds at the point of contact and is repeated twelve times.	Arm Raise in Front of Face	3
60sec	40sec	4×	Movement for 10 seconds	From a standing position, the arms are brought together in front of the face and returned to the starting position at shoulder level (a semicircle in front of the face).	Arms Open in Front of Face	4
60sec	15sec	3×	Movement for 15 seconds	From a standing position, the arms are raised to the sides at shoulder level with the palms facing upwards. The arm is then rotated around its axis to move the shoulder joint.	Arm Rotation Around Shoulder Center	5

Total unit time	Rest between exercises	Rest between repetitions	Performance time and repetitions	Exercises Used	Unit Objective:	Unit
61.8 sec	1,110sec	650sec	1,950sec	All the above exercises are used	Rehabilitation of the muscles surrounding the shoulder joint and restoration of range of motion.	Unit 1
61.8 sec	1,110sec	650sec	1,950sec	All the above exercises are used	Rehabilitation of the muscles surrounding the shoulder joint and restoration of range of motion.	Unit 2
61.8 sec	1,110sec	650sec	1,950sec	All the above exercises are used	Rehabilitation of the muscles surrounding the shoulder joint and restoration of range of motion.	Unit 3
If the patient experiences pain while performing exercises, they should rest and ice should be applied to the joint						

Pre-tests.
After identifying the key variables, instruments, and devices used, and confirming their suitability, pre-tests were conducted on September 15 and 16, 2024.

Program Implementation.

The training program commenced on May 10 and concluded on March 5, 2025, lasting for twelve (12) weeks.
Post-tests.
Following the completion of the training program with the main research sample, the researcher conducted post-tests for the research variables on April 20, 2024, using the same pre-test methodology.

Presentation, Analysis, and Discussion of Results.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
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Table (4) shows the arithmetic mean, standard deviation, and statistical significance for the pre-test and post-tests of the range of motion and physical variables of the rotator cuff for the experimental group.

Moral	Statistical significance	Calculated t-value Moral	Post-test		Pre-test		Unit of measurement	Variables		No
			Standard deviation	Arithmetic mean	Standard deviation	Arithmetic mean				
Moral	0,000	Moral	0.822	5.967	0.575	3.621	meter	Explosive power of the arms and shoulders		1
Moral	0.003	Moral	13.211	48	10.311	32	degree	Shoulder joint flexibility		2
Moral	Moral	9.176	Moral	161	10.666	129	degree	degree	range of motion of the shoulder joint	3
Moral	Moral	21.222	Moral	169	11.401	82	degree	degree		
Moral	Moral	14.033	Moral	54	7.311	28	degree	Unit of measurement		
Moral	Moral	10.683	Moral	56	7.183	32	degree	meter		

The researcher observes, through reviewing the results in Table (4), that the physical rehabilitation program applied to the experimental group achieved a significant improvement in almost all measurements. This is demonstrated by comparing the results of the pre-test (before application) and post-test (after application). Statistical significance (p-value) is key here; the less the p-value (0.05), the more statistically significant the improvement, indicating that it is not accidental but rather a direct result of the physical rehabilitation program.

The researcher attributes these differences to the proposed rehabilitation program, which incorporated rest periods between repetitions and exercises. Rest can be described as a recovery phase, where the body is restored to its natural state and vitality. This recovery phase, by its very nature, plays a crucial and tangible role in restoring a person to their normal and healthy condition, which manifests in the restoration of function and coordination among the various body systems. Furthermore, the use of physical exercises in conjunction with physiotherapy sessions led to the effective application of exercises to the maximum possible effort by the injured athlete, which in turn led to the development of muscle strength. This is because "the use of exercises increases the number of active motor units and also leads to neurological adaptation in the alternation of muscle fiber activity, which is reflected in strength development." ( ) The researcher also believes that the program effectively contributed to improving the strength of the muscles responsible for explosive movements. This improvement is attributed to the rehabilitation exercises that focused on improving the strength of the muscles operating in the shoulder and arm joints and increasing their contraction speed, in addition to a noticeable improvement in range of motion. This indicates the effectiveness of the exercises in restoring flexibility and the ability to move the arm away from the body, thus reducing stiffness and improving functional performance. Consequently, the rehabilitation approach was very successful in improving most of the physical variables directly related to the boxers' performance (explosive power, distance, backward rotation)

The researcher attributes these differences to the effectiveness of the proposed (physical) rehabilitation method in improving most of the physical and motor measurements of the upper limbs of injured boxers in Dhi Qar Governorate. The results showed statistically significant differences in the post-test variables for explosive arm and shoulder power, snatch, and shoulder backward rotation. The researcher believes this noticeable improvement is due to the scientifically designed rehabilitation program that considers the nature of the injury and the boxer's performance requirements. Regarding explosive power, the improvement resulted from the program's inclusion of plyometric and dynamic resistance exercises, which enhance neuromuscular coordination and increase the rate of force generation. Romanova et al. (2025) indicated that "a creative approach to health-oriented physical education improves the overall health of school-aged children, highlighting the importance of psychological and motivational aspects in structured physical activities".

- (Romanova et al., 2025)Studies show that "the use of athletics in physical education training is associated with improved overall physical performance in older students, reinforcing the role of structured training programs in enhancing motivation among athletes." (Eshiev et al., 2025)
- Romanova et al. (2025) confirmed that “improving basketball technique in the early stages of training contributes to raising the level of interaction and self-motivation in young players, which may be relevant to the motivation of an injured athlete upon returning to training after injury”.
- (Romanova et al., 2025)Vorozheikin et al. (2025) found that “the formation of motivation in children aged 9–10 years directly affects their participation and persistence in sports training,” indicating the importance of motivation in adolescent athletes as well.
- Vorozheikin et al., 2025)Bocharin et al. (2025) stated that “the metabolic response to intense physical exertion is an important indicator in evaluating the performance of student-athletes,” demonstrating that biological factors can play a role in the intrinsic motivation to engage in sports activity.
- (Bocharin et al., 2025)A study by Kudryavtsev et al. (2024) showed that “the physical, technical, and functional characteristics of young athletes vary according to their speed development levels,” reflecting the link between physical abilities, motivation, and athletic performance.
- (Kudryavtsev et al., 2024)Mazkr (2025) indicated that “the percentage contribution of sustained attention significantly affects the performance of the right headbutt in advanced boxers,” an aspect that can be linked to motivation and athletic focus after injury.
- (Mazkr, 2025)Studies have shown that “rehabilitative training with the use of assistive devices can effectively contribute to the treatment of lumbar curvature in weightlifters, illustrating the therapeutic and motivational role in restoring athletic performance.” (Ibrahim, 2025)
- Jassim et al. (2025) found that “rehabilitative exercises supported by platelet-rich plasma injections improved some motor functions in individuals with knee problems,” demonstrating the importance of supportive treatment options in increasing motivation to return to sports.
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- (Abd, 2025)The researcher agrees with the findings of Haff & Triplett (2015) that “plyometric and dynamic exercises are essential for improving performance strength in explosive sports”.

Conclusions

1. A physical rehabilitation program was developed to address rotator cuff weakness in boxers in Dhi Qar Governorate.
2. The impact of the rehabilitation program on improving the physical condition of boxers with muscle weakness in Dhi Qar Governorate was identified.
3. The rehabilitation program contributed to the development of Some physical changes were observed among boxers in Thi-Qar Governorate.

Recommendations:

1. Establish centers of excellence for integrated rehabilitation that bring together different specialties under one roof to address various injuries.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
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2. Emphasize the importance of carefully selecting physical exercises in rehabilitation programs to suit the severity and type of injury, as well as the physical fitness level of the injured athlete.
3. The researcher recommends using rehabilitation programs in conjunction with physical therapy equipment, based on the results demonstrated by the research sample and other samples.

References

1. Abd, M. T. (2025). The effect of quadruple position exercises on the rehabilitation of people with nonspecific low back pain. University of Thi-Qar Journal for Sciences of Physical Education, 2(2), 447–462.
2. Bocharin, I., Hassoon, A., Arsenina, Y., Guryanova, A., Usonuulu, Z., Martirosova, T., … & Sadykov, R. U. S. L. A. N. (2025). Metabolic response of students' organisms after maximum-power physical activity. Journal of Physical Education and Sport, 25(4). https://doi.org/10.7752/jpes.2025.04092
3. Bustris, Qais Naji Abdul Jabbar, and Ahmed, Bustris Ahmed. (1987). Testing the Principles of Statistics in the Field of Mathematics. Baghdad: Higher Education Press, p. 363.
4. Bustris" was used in the formatting because APA uses the first Latin letter of the transliteration when combining foreign sources
5. Eshiev, A., Alshuwaili, H., Usonuulu, Z., et al. (2025). Efficiency of using track and field in physical education training for senior schoolchildren. Journal of Physical Education and Sport, 25(2), 269–276. https://doi.org/10.7752/jpes.2025.02030
6. Francis, Faleh. (1986). Microtoma among athletes in Iraq. Journal of the Second Conference of Colleges of Physical Education, University of Basra, Alaa Press, p. 45.
7. Haff, G. G., & Triplett, N. T. (2015). Essentials of strength training and conditioning (4th ed.). Human Kinetics.
8. Ibrahim, C. S. (2025). The effect of rehabilitation exercises according to some aids to treat lumbar concavity in weightlifters. University of Thi-Qar Journal for Sciences of Physical Education, 2(3.1), 541–557.
9. Jassim, M. M. A., Khalil, A. M., & Saleh, J. M. (2025). Rehabilitation exercises supported by plasma-rich platelet injections to improve some motor functions of people with knee roughness. University of Thi-Qar Journal for Sciences of Physical Education, 2(2), 196–207.
10. Kudryavtsev, M., Alshuwaili, H., Kopylov, Y., Aldiabat, H., Osipov, A., Bliznevskaya, V., … & Miasnikova, O. (2024). Distinctive characteristics of physical, technical, and functional fitness in young football players with varied levels of speed development. Journal of Physical Education and Sport, 24(1), 75–81. https://doi.org/10.7752/jpes.2024.01010
11. Mazkr, H. S. (2025). The percentage of continuous attention contributing to the performance of the right straight punch to the head among advanced boxers. University of Thi-Qar Journal for Sciences of Physical Education, 2(3), 167–175.
12. Mazin, Abdul-Hadi Ahmed, and Mazin, Hadi Kazar. (2015). Advanced Readings in Learning and Thinking: An Introduction to Movement Sciences for Students of Colleges and Institutes of Physical Education. Iraq: Dar Al-Kutub Al-Ilmiyah, p. 81.
13. (Mazin was considered in the ranking Romanova, E., Alshuwaili, H., Zhutanova, G., Baisubanova, V., Kudryavtsev, M., Osipov, A., … & Etrov, V. (2025). Correcting the physical health in 10–12-year-old schoolchildren through a creative approach to health-focused physical education. Journal of Physical Education and Sport, 25(2), 284–291. https://doi.org/10.7752/jpes.2025.02032
14. Romanova, E., Hassoon, A., Akmatova, A., Usonuulu, Z., Sulaimanova, G., Omorov, T., … & Udalykh, A. (2025). Improving basketball technique at the initial training stage for boys. Journal of Physical Education and Sport, 25(4). https://doi.org/10.7752/jpes.2025.04091
15. Vorozheikin, A., Hassoon, A., Kurbanbaeva, N., Sushchenko, V., Glukhov, A., Zimonovsky, A., & Anisimov, M. A. X. I. M. (2025). Formation of motivation for judo classes in 9–10-year-old children. Journal of Physical Education and Sport, 25(4), 842–849. https://doi.org/10.7752/jpes.2025.04090