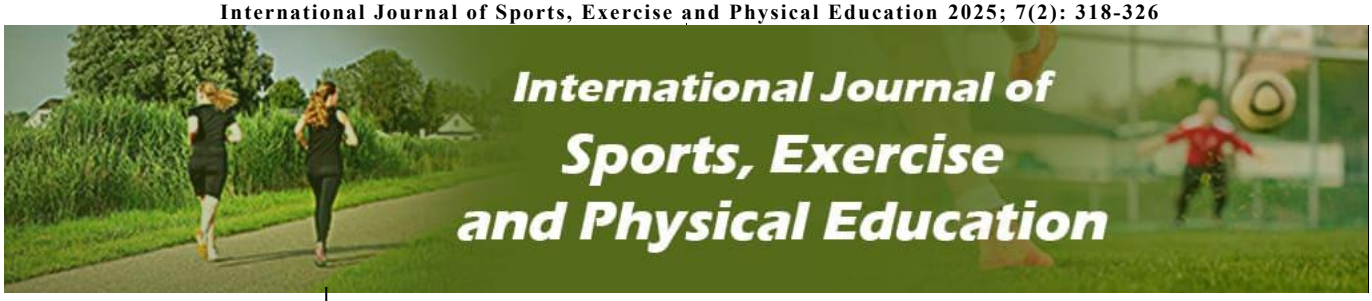

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The effect of a program using exercises (Yoga) to treat and rehabilitate volleyball players with some soft shoulder girdle injuries

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Abstract
The research seeks to ascertain the degree of influence exerted by a rehabilitation program employing yoga exercises on the restoration of motor efficiency in athletes with soft tissue injuries of the shoulder girdle. The researcher adopted an experimental methodology utilising a one-group design to align with the research's nature and objectives. The sample was deliberately selected from first-class volleyball players in clubs within Misan governorate for the 2024-2025 season, specifically those diagnosed with soft shoulder girdle injuries by a specialist physician. The sample comprised six players, including two participants for the exploratory study, with data collection facilitated through various tests and metrics. The data were analysed statistically using the Statistical Package for the Social Sciences (SPSS). The study findings indicated: The proposed rehabilitation program demonstrated a positive effect, evidenced by statistically significant differences in the pain scale across pre-, mid-, and post-measurements, indicating that the rehabilitation exercise program effectively reduced pain levels in the shoulder joint area. The proposed rehabilitation program and yoga exercises yielded statistically significant differences in the range of motion across pre-, mid-, and post-measurements, demonstrating a positive impact on the flexibility of the shoulder girdle in all directions. The proposed rehabilitation program demonstrated a positive effect, resulting in statistically significant differences among pre-, mid-, and post-measurements in muscular strength. The rehabilitation exercise program positively influenced the enhancement of explosive power, speed-strength characteristics, and strength extension in the shoulder girdle region. Recommendations included prioritising rehabilitation exercises administered by a physiotherapist for injury recovery, and including integrated rehabilitation activities, such as yoga, which provide exceptional outcomes for sports injuries in several disciplines.

Keywords: Exercises yoga, treat, rehabilitate, soft shoulder girdle, injuries

Introduction
Contemporary sports training across diverse disciplines constitutes a systematic educational process grounded in advanced scientific methodologies (Cereda, 2023) [9]. Its objective is to identify optimal training techniques and applications that align with the specific characteristics of each sport, thereby facilitating athletes' progression to elite levels (Haugen *et al*., 2019) [21]. This pursuit is emblematic of the aspirations of developed nations, as superior performance is indicative of meticulously structured training (Ali & Kasim, 2022; Ilundáin-Agurruza, 2018) [1, 23]. Consequently, this approach enhances athletes' muscular capabilities and elevates their skill execution to attain global standards (Jabbar & Kasim, 2023; Paillard, 2019) [25, 34]. The incidence of sports injuries is markedly increasing due to the extensive repetition of movements in activities that necessitate abrupt and forceful actions during various gameplay scenarios (Forelli *et al*., 2024) [19]. Contributing factors include inadequate stadium conditions, neglect of warm-up routines, excessive friction among players, execution of complex manoeuvres, significant muscular exertion during exercise or competition, and insufficient physical conditioning of athletes prior to performance, which is disproportionate to the demands of such exertion (Wentao, 2024) [44]. In the event of injuries, which need the care of all personnel in the sports domain, it is a critical aspect that compels the athlete to withdraw from competitive activities (Peterson, Renstrom & Lynch, 2024) [36]. The prevalence of shoulder joint injuries among athletes has escalated, garnering global attention and concern, to the extent that such injuries have emerged as a worldwide

phenomenon evident during competitions (Sedegah, 2020) [40]. Ligament and tendon ruptures of the shoulder joint rank among the most frequent injuries sustained by volleyball players, attributable to various factors, including inadequate warm-up, the execution of unmastered skills, insufficient muscle conditioning, and continued exertion under stress (Bahrambeigy, 2024) [5]. A precise diagnosis of the injury and suitable rehabilitation of the affected area, aligned with the rehabilitation program tailored to the demands of the injured individual's activity and the nature of their work, as well as all relevant factors influencing the injured person's condition such as age, gender, health status, and history whether the individual is an athlete or non-athlete, facilitates a swift return to their normal state (Zhao, 2024) [46]. This is achieved through the researcher's access to scientific literature, studies, and the international information network addressing prevalent injuries among volleyball players, complemented by the researcher's expertise (de Azevedo Sodré Silva *et al*., 2023) [15]. Specialised in the domain of injuries and rehabilitation The rupture of ligaments and tendons in the shoulder joint is a prevalent injury among volleyball players (Bahrambeigy, 2024) [6]. This observation motivated the researcher to utilise available information and expertise to develop a proposed rehabilitation program incorporating yoga exercises for the treatment and rehabilitation of specific soft tissue injuries to the shoulder girdle joint in volleyball players, aiming to mitigate the occurrence and recurrence of such injuries (Chojęta *et al*., 2020) [10]. The practice of yoga has shown its efficacy in alleviating back and neck pain, enhancing muscular flexibility, and significantly contributing to the protection of joints from inflammation and discomfort (Ali & Kasim, 2022; Maenpuen *et al*., 2025) [2, 30]. This research aims to enhance the rehabilitation and treatment of injured volleyball players by fortifying the muscles associated with the shoulder joint, alleviating stress on cartilage, ligaments, and tendons, and improving the range of motion. Consequently, this approach may mitigate pain. The significance of this study lies in the formulation of a rehabilitation program that incorporates yoga exercises to address specific soft tissue injuries of the shoulder girdle joint, given the critical role of this joint in facilitating players' technical skills. The functionality of the upper limb mostly relies on the integrity and efficacy of this joint.

Research problem

Physiotherapy serves as a rehabilitative intervention following diagnosis and is employed alongside other therapeutic measures in injury cases (Ishøi *et al*., 2020) [24]. Its primary objectives are to avert complications, rehabilitate the affected area, and restore normal movement and essential functions of organs and joints (Peterson, Renstrom & Lynch, 2024) [36]. This includes enhancing joint mobility and flexibility to prevent stiffness and maintain prior activity levels, thereby facilitating the injured individual's prompt return to their normal state and recreational activities (Forelli *et al*., 2024) [19]. Modern techniques in the treatment of sports injuries, particularly muscle ruptures around the shoulder, facilitate expedited and enhanced rehabilitation (Reddy, 2024) [39]. Additionally, rehabilitation exercises are a crucial natural method in the comprehensive treatment of injuries, contingent upon the specific type of injury (Peterson, Renstrom & Lynch, 2024) [36]. Experts assert that shoulder joint injuries are the second most prevalent kind of injury, behind knee joint injuries, across all age groups of athletes (Liaghat *et al*., 2021) [28]. These injuries often occur in sports that include repetitive overhead arm movements (Lin, Wong & Kazam, 2018) [29]. Shoulder injuries sustained during sporting activities arise from prolonged and repetitive usage in activities requiring continuous arm movement, which may exert pressure on the surrounding soft and fibrous tissues of the joint (Cools *et al*., 2021) [12]. Notwithstanding advancements in medical sciences, the implementation of innovative treatment methodologies, the utilisation of cutting-edge equipment, and the availability of specialised medical professionals, the prevalence of injuries remains significant, jeopardising performance levels (Zhang *et al*., 2023) [45]. Recently, injuries have emerged as a pressing concern for athletes and sports professionals, with a notable increase in incidence among players. Thus, the research challenge emerged as a scientific endeavour aimed at developing a rehabilitation therapy program. Utilising yoga techniques in the treatment of specific soft tissue ailments of the shoulder girdle joint.

Research objectives

The study aims to ascertain:

1. The impact of the rehabilitation program developed by the researcher, including yoga activities, on several functional variables related to soft tissue injuries in the shoulder joint of volleyball players through:

a) Alleviate and diminish the intensity of discomfort while expediting and facilitating the recovery of certain soft tissues around the shoulder joint under examination.

b) Enhance the muscular strength of the shoulder girdle in all its variations (explosive power, speed-related force, and strength endurance).

c) Enhancing the shoulder joint's range of motion concerning flexion, extension (anterior and posterior), internal and external rotation, as well as circumduction and dimensionality.

Research hypotheses

1. The researcher posits that the rehabilitation program including yoga movements positively impacts the treatment of certain soft tissue injuries in the shoulder joint among volleyball players in clubs within Misan governorate.
2. The researcher posits that disparities exist in the treatment and rehabilitation of the injuries being examined in the shoulder joint.

Research areas

Human area: Players with some soft tissue injuries in the shoulder joint and participants in the Iraqi Premier League and the First Division League clubs for applicants in Misan Governorate, which numbered (5) injured and for the sports season (2024-2025).

Time area: For the period from 1/10/2024 to 1/5/2025

Spatial area: Medical Rehabilitation and Physiotherapy Centre at Al-Sadr General Hospital and some centres in the governorate.

Methodology

Research Methodology

The outcomes and significance of the research are intrinsically linked to the methodology employed (Jones, 2022). Given that the nature of the problem dictates the

selected approach, the researcher opted for an experimental design featuring a single experimental group with pre- and post-tests, as it aligns with the research's characteristics and facilitates the attainment of precise results.

Research community and sample

The methodology imposed on the researcher for sample selection is dictated by the nature of the research procedures. Consequently, the researcher identified the research community as the injured volleyball players in Misan Governorate for the years 2024-2025. This community was deliberately selected to effectively fulfil the objectives of the study conducted by the researcher (Andrew, Pedersen & McEvoy, 2019) [4]. Six players had soft tissue injuries to the shoulder girdle joint, representing 80% of the original population after eliminating two irregular individuals.

Homogeneity of the sample

To mitigate any factors that might affect the research outcomes and to ensure uniformity across the sample regarding the variables under investigation, which impact the experiment and need adjustment, the researcher performed a homogeneity analysis as shown in Table (1).

Table 1: Shows the homogeneity of the sample in variables (chronological age, training age, height, type of injury, date of occurrence)

Variable	Unit of measurement	M	SD	Torsion coefficient
Age	Year	27	1,32	0,320
Training age	Year	7,3	1,65	0,345
Length	Cm	185	3,32	0,570
Type and degree of injury	Some soft tissue injuries of the shoulder girdle joint	42,3	3,55	-0,440
History of injury	Day	13,4	1.23	-0,470

The results presented in Table (1) indicate that the torsion coefficients ranged between (-+1), signifying the homogeneity of the sample across all variables and a moderate distribution within the natural chaos curve (-+3). This suggests a statistical assurance that no outliers will influence the outcomes of subsequent study tests.

Devices and tools used in research

It is the approach or technique used by the researcher to address their issue, irrespective of its nature (Skinner, Edwards & Smith, 2020) [41]. Consequently, the researcher used techniques that enabled him to achieve the primary objective of the study. The researcher used instruments for assessing weight and height. Goniometer to assess the joint's range of motion. A dynamometer for assessing shoulder muscle strength.

Means of collecting information: The researcher used personal interviews, references, and sources from both Arab and international information network questionnaire forms.

Diagnosis of injury: The injuries, together with their degrees and severity, were assessed by a specialised physician by clinical examination and magnetic resonance imaging.

Determining the physical abilities and nominating the tests concerned with measuring the physical abilities and skills studied

Following an examination of several sources and expert interviews about physical and skill assessments, several tests were chosen and organised into a questionnaire format, with the researcher basing the selection of relevant tests on their relative significance.

Tests used in the research

1. Test of throwing the medical ball (3 kg) from above the head with the hands from a sitting position on the chair (Harris *et al*., 2011) [20].
2. Test bending and stretching of the elbow joint from the position of attachment to the obstacle (Zwerus *et al*., 2018) [48].
3. Test to measure the strength endurance of the muscles of the arms (Prasetyo, Prasetyo & Wali, 2022) [37].
4. Test range of motion of the shoulder joint (Daneshmandi *et al*., 2010) [14].

a) Test the range of motion of the shoulder joint in case of lifting in front of the body (Kruszewski *et al*., 2022) [27].
b) Test the range of motion of the shoulder joint in case of lifting behind the body (Barlow *et al*., 2002) [7].
c) Test of the range of motion of the distal shoulder joint (Sprague *et al*., 2014) [42].
d) Test the range of motion of the rotation shoulder joint (Ellenbecker *et al*., 1996) [18].
e) Visual symmetry test to measure the degree of pain (Magill *et al*., 2021) [31].

Exploratory experiment

Scientific research specialists the primary recommendation for achieving accurate and reliable results is to perform an exploratory experiment. Consequently, the researcher conducted this exploratory experiment on Saturday, February 6, 2025, at 3 PM, involving two players with partial ruptures of the large lumbar muscle from the original research community, outside the primary research sample. These participants adhered to the conditions and specifications of the original sample test, with the objective of ensuring the safety and accuracy of the devices and tools, as well as training on their usage.

1. Acknowledging the challenges and issues that the researcher may encounter.
2. Determine the duration required for conducting testing.
3. Assessing the suitability of the workouts used by the participants in the study sample.
4. Determine the timing of the qualifying workouts for the sample.
5. Familiarizing the assistance team with their specific responsibilities.

The exploratory investigation yielded the following results

1. Appropriate assessments for the study cohort.
2. The accuracy of the instruments and equipment used in measuring.
3. The sample's capacity to execute the rehabilitative workouts designated in the program.
4. Modifying the envisaged rehabilitation units till their finalisation.

Pre, middle and post tests

The tests were administered frequently and virtually continually, in accordance with the injury, so allowing the

program's application to persist among the study sample members under the direct observation of the researcher. The researcher administered the first pre-test on April 19, 2025, the first intermediate exam on May 15, 2025, and the first post-test on June 2, 2025.

Preparation of rehabilitation exercises

One responsibility of the researcher is to examine sources, scientific references, and prior studies pertinent to the research topic, as well as to conduct personal interviews with several specialists and experts in sports rehabilitation and physiotherapy for athletes with soft tissue injuries to the shoulder girdle joint. Subsequently, the researcher must prepare a rehabilitation program for injured athletes, incorporating rehabilitation exercises, noting that there are three rehabilitation sessions per week. The suggested rehabilitation training program was established based on a study of scientific studies and research, leading the researcher to establish the following broad objectives:

1. Alleviate the severity of the injury.
2. Encouraging the wounded athlete to engage in physical activity.
3. Enhance blood circulation to the impacted muscles and organs.
4. Restore the range of motion in all directions.
5. Enhancing muscular equilibrium throughout the body and augmenting the strength of the abdominal, back, and leg muscles.

The rehabilitation program devised included physical activities aimed at rehabilitating shoulder joint ailments, including weightless exercises, bodyweight exercises, medical ball exercises, as well as workouts using dumbbells and a barbell. The objective of these workouts is to strengthen the shoulder joint muscles, enhance their flexibility, and expand the range of motion, aiming to restore mobility to its normal capacity in all directions. The rehabilitation program spanned six weeks and employed a graduated approach to both the intensity of physical exertion and the complexity of exercises. It commenced with unweighted exercises, progressed to bodyweight exercises, and subsequently incorporated weighted exercises utilising iron dumbbells and bars. The curriculum included a framework for the components of the comprehensive rehabilitation unit for all weeks, which are delineated as follows: preliminary portion, major part, and final section. The researcher considered that the rehabilitation activities are contemporary and fundamentally distinct from conventional workouts used. Within the treatment centres, the researcher included music via a hearing aid positioned in the ear of the wounded athlete during yoga movements. Rehabilitation activities for athletes with soft tissue injuries of the shoulder girdle joint include the following:

1. **Warm-up exercises:** This phase encompassed stretching exercises and comprehensive preparation for all bodily regions and primary joints, aiming to facilitate the subsequent rehabilitation exercises, enhance the psychological condition of the injured athlete, alleviate pain, improve muscle tone, and promote blood circulation in the shoulder joint area.
2. **Structural exercises:** The researcher sought comprehensive structural workouts targeting both major and small muscle groups, including the upper and lower body, including the head, neck, back, arms, and legs, using various equipment.
3. **Special rehabilitation exercises:** It incorporates strengthening exercises for weak shoulder joint muscles via free activities, with or without equipment, while also including flexibility exercises, respiratory workouts to enhance respiratory function, and bodyweight exercises.
4. **Calming exercises:** The researcher emphasised that the purpose of these exercises is to facilitate muscular relaxation, detailing the steps of implementing the recommended rehabilitation units, their aims, and the transitions between stages.

Application of rehabilitation exercises

1. The researcher implemented rehabilitation exercises for the research sample over a duration of six weeks, targeting players with soft tissue injuries to the shoulder girdle joint. The rehabilitation regimen incorporated both rehabilitation and yoga exercises, grounded in contemporary sources and scientific literature, while adhering to the principle of progressive intensity increase.
2. The researcher considered the principle of progressive overload in training, beginning with passive exercises in the initial week and subsequently increasing the difficulty of exercises through self-resistance methods in the following weeks, incorporating both weight and body resistance in external exercises.
3. The notion of diversity and modification in rehabilitation exercises about the quality of the activities, their fundamental conditions, and the instruments used.
4. The researcher and his helper team executed the rehabilitation program.
5. The researcher and the wounded athletes must exercise vigilance and prudence to prevent any stress or external impact on the damaged region, hence reducing the risk of injury sequelae.
6. The curriculum was implemented at a rate of three rehabilitation units per week for a duration of six weeks, resulting in a total of eighteen therapy units.
7. Variation in exercise intensity via the weights used in the program.
8. The duration for rehabilitation activities inside the unit is categorised according to the recovery phases, ranging from 30 to 60 minutes.

Statistical methods

The researcher used the Statistical Package for the Social Sciences (SPSS) version 25 to analyse the study findings.

Results

Presentation, analysis and discussion of results

In consideration of the measures used in the study and to enhance the technique of presentation, the researcher elucidated the data obtained using statistical analyses as follows:

Presentation and analysis of pre, middle and post tests

Table 2: Shows the arithmetic means and standard deviations of the variables under consideration in the three tests (pre, median, and post) for volleyball players with some soft tissue injuries of the shoulder girdle joint

Variables	Unit of measurement	Pre-test		Middle test		Post-test	
		M	SD	M	SD	M	SD
Degree of pain	Degree	3,90	0,79	2,30	1,03	0,81	0,78
Bending forward	Degree	110,39	7,98	146,20	23,03	165,80	15,10
Tide backwards	Degree	20,90	5,27	43,20	7,73	52,10	5,89
Dimensions	Degree	110,90	9,60	148,00	8,60	171,42	7,80
Rounding	Degree	16,70	5,80	31,30	8,99	64,00	9,02
Recycling in	Degree	107,88	8,95	142,04	17,02	169,10	17,20
Recycling out	Degree	130,00	12,11	140,39	18,05	169,08	8,04
Explosive power of the arm	Cm	5,03	0,37	5,90	0,39	6,06	0,16
Speed characteristic force of the arm	Degree\ Snd	7,00	2,30	7,90	2,50	8,70	0,91
Extended force for arm	Degree	22,40	3,60	24,00	3,00	31,00	3,80

Table 5: shows the analysis of the variance between the three tests (pre-mediate-post) for the variables under study

Variables	Contrast source	Sum of squares	Average squares	T	Sig
Degree of pain	Between the group	114,44	55,67	74,36	0.000
	Within the group	53,39	0,56		
Bending forward	Between the group	16633,56	18015,222	60,88	0.000
	Within the group	170731	165,045		
Tide backwards	Between the group	122,29	5158	176,71	0.000
	Within the group	2513	34,205		
Dimensions	Between the group	25578	21238	111,22	0.000
	Within the group	3200	73		
Rounding	Between the group	17416	12258	115,82	0.000
	Within the group	2533	42,100		
Recycling in	Between the group	22630,447	12320,222	145,22	0.000
	Within the group	9226	132,316		
Recycling out	Between the group	10292,448	10054,222	76,42	0.000
	Within the group	7276	114,222		
Explosive power of the arm	Between the group	131,644	113,728	131,76	0.000
	Within the group	54,264	0,611		
Speed characteristic force of the arm	Between the group	1033,116	216,022	33,44	0.000
	Within the group	446,040	09,121		
Extended force for arm	Between the group	1022,104	316,032	46,34	0.000
	Within the group	546,060	10,335		

Discussion of the results

Sports injuries manifest in varied severities during contests or training sessions, necessitating a treatment time that prohibits the athlete from engaging in any activity, hence adversely impacting their physical and functional fitness. The data in the preceding two tables indicate substantial disparities across the three tests (before, intermediate, and post) and the factors examined. The results indicate significant differences favouring the post-test of the research sample. The researcher attributes this to the rehabilitation program developed, which substantially aided in the recovery of the injured area and enhanced the strength of the shoulder joint's muscle groups. This rehabilitation was supplemented by the use of electrical stimulation devices and yoga exercises to facilitate muscle recovery. Muscular exertion and the implementation of exercises utilising various resistors and weights aim to enhance the sensory receptors and tendons associated with this joint. Furthermore, the incorporation of yoga exercises significantly contributes to the players' perception of joint mobility restoration and facilitates superior outcomes in achieving the study's objectives by effectively promoting muscular synergy, characterised by a regulated process of contraction and relaxation in terms of strength and timing (Deshmukh *et al*., 2024) [16]. The researcher attributes these differences to the influence of the rehabilitation program implemented for the study sample, which afforded the injured individuals in this category the opportunity for swift recovery and rehabilitation within the structured curriculum. This program incorporated exercises utilising both fixed and mobile muscle contractions, with the mobile exercises distinguished by the application of the principle of appropriate muscle elongation (motor). Peart *et al*. (2019) [35] indicate that this principle has directly contributed to the enhancement of strength in the injured group members. The random variations seen in the analysis of variance test throughout the pre-, mid-, and post-tests of the injury types under investigation, namely ligament rupture, partial muscle

tear, and myositis. This indicates that there is no distinction between the groups, signifying that the impact of therapeutic physical exercises was uniform across all injury types. The rehabilitation program developed proved to be effective and advantageous, and the reduction in pain levels observed in the pre-test resulted from the application of physiotherapy during the initial week. This development, characterised by varying degrees of pain, was not incidental; it resulted from the nature of the structured curriculum and the therapeutic exercises it encompassed, along with the rest periods that aligned with the terminology of the rehabilitation curriculum's application. The method to restore muscular tone to the muscles around the afflicted joint until complete healing is achieved. The researcher ascribed the advancement of hospitalisation for the wounded to the implementation of rehabilitation activities designed by them, which significantly contributed to alleviating discomfort. The alleviation or absence of pain serves as a genuine sign that validates the safety of the employed activities and their appropriateness for the specific injury kind. Thus, the wounded individuals may begin workouts from the third week with ease, without imposing strain on the affected area. The dedication of the wounded individuals and their interaction with the researcher enabled the implementation of exercises in a unique way to get approval for their return to the stadiums, since they are registered players in their teams competing in the Iraqi League. The exercises prescribed at the week's outset were physiologically aligned with the size and nature of the injury, as assessed at the beginning of the units with the physician's approval at the designated physical therapy centre, aimed at facilitating healing and alleviating pain progressively without fostering habituation. The researcher ascribes these findings to the therapeutic activities, which alleviated pain enough for the wounded to attain these outcomes. The appropriate application, effective execution, and direct oversight by the researcher yielded data indicating that the approach of diversity and modification in therapeutic physical workouts contributed to the prevention of injury recurrence. Moreover, the dimensions of boredom and other psychological aspects indicate that each increment in training load, both intensity and volume, is counterbalanced by an enhancement in the functional ability of organic systems to facilitate growth and development. Observing the shoulder joint's range of motion reveals an enhancement relative to pre-rehabilitation measurements, with a notable improvement attributed to the prescribed exercises and the participants' adherence, as evidenced statistically. This hospitalisation significantly contributed to the rehabilitation program for the shoulder joint's mobility and restoration of its prior flexibility, with the researcher considering a progression from simpler to more challenging tasks. Additionally, the intensity of each exercise was considered, since most flexibility exercises were scheduled during the morning training sessions due to their focus on flexibility. In the morning, it is enhanced in the person. The significance of joint flexibility in athletic movements is paramount, as insufficient flexibility heightens the risk of injury during sports activities or specific events; however, enhanced flexibility can augment the range of motion, thereby improving an athlete's performance level (Ali & Kasim, 2023; Rahman & Islam, 2020) [3, 38]. The analysis of the data indicates that the enhancement seen between the pre-test, mid-test, and post-test resulted in significant progress in forward bending, backward extension, rounding, and both internal and external rotation dimensions. The study attributed this to therapeutic physical workouts combined with yoga, which activated muscles, tendons, and ligaments after a period of inactivity. The program encompasses many strategies for enhancing the range of motion prior to both static and dynamic flexibility exercises, as well as the execution of these activities. Gradually and with maximal range of motion facilitated the attainment of these goals. Achieving adequate flexibility in the muscles, tendons, and ligaments of a specific joint or group of joints during a particular movement relies on the volume and intensity of exercises conducted across a broad range of motion, in addition to the individual's pre-existing level of flexibility (Rahman & Islam, 2020) [38]. The researcher determined that the intermediate and post-tests outperform the pre-test across all study factors, since the wounded athlete need sufficient time to navigate the challenging first phase of the injury. The researcher ascribes the moral alteration in the range of motion and the majority of variables to the minimal ideal motion range, attributing it to the efficacy of therapeutic exercises in mitigating motor expansion in the affected region, as these exercises enhance bodily flexibility, activity, and neuromuscular coordination (Cech & Martin, 2023) [8]. The researcher posits that the advancement resulted from the efficacy of the rehabilitation program's vocabulary, which was designed according to sound scientific principles and predicated on the effectiveness of the exercises employed to fortify the muscle groups surrounding the affected joint in the study sample. The study of the tables revealed that the optimal option is post-selection, leading the researcher to conclude that the qualifying strategy used to the sample is favoured in the post-test. The researcher credits the advancement to the vocabulary of the rehabilitation program he implemented, which aligns with the scientific principles employed in assessing the necessary intensity for enhancing the strength of the specific muscle groups responsible for the fundamental motor function of the shoulder joint. Consequently, the research sample in the post-test nearly attained the upper limit of the normal range of motion. The rationale for this is to highlight the efficacy of therapeutic physical exercises in alleviating motor restrictions and enhancing the flexibility and strength of joints, ligaments, and muscles (Rahman & Islam, 2020) [38]. The researcher emphasises that the enhancement in flexibility reflects the proportionality between the program's duration of six weeks and the training doses, which include individual and stretching exercises targeting the muscles of the arms and shoulders, as well as overall body flexibility. This significantly enhances the capacity of muscles and ligaments to elongate, thereby expanding joint mobility, which is crucial in volleyball. It is vital for developing the strength necessary for rapid and efficient execution of movement skills, while also playing an active role in alleviating muscle soreness and postponing fatigue (Tengelbaevich & Adilovna, 2025) [43]. The factors of muscular strength, as shown by the researcher's findings from the tests of maximal strength, speed strength, and strength endurance, reveal substantial disparities across all three assessments. The researcher ascribes this advancement in the post-test to the curriculum's vocabulary, consistent

implementation, and ongoing oversight by the researcher, which significantly influenced this progress. together with the implementation of therapeutic physical activities and yoga, and the ongoing enhancement of strength to counteract decline. The degrees of discomfort indicate that the curriculum's language was coherent, including rest, physical exercises, static workouts, dynamic exercises, and combined activities. The development of strength is significantly influenced by physical workouts, which enhance strength, while inactivity leads to a decline in strength (Zhu *et al*., 2020) [47]. This aligns with Hilton and Lundberg (2021) [22], indicating that the cultivation of moral strength involves the selection of both static and dynamic workouts included into the rehabilitation program to achieve optimal outcomes. The increase in strength levels does not inherently indicate muscle growth; rather, it may be contingent upon the nervous system's efficacy in activating or optimising muscular activity (Chuckravanen *et al*., 2019) [11]. The researcher posits that opinions, despite varying methodologies in practical and scientific culture, indicate that a rehabilitation program will invariably yield the desired outcomes if it is founded on a scientific framework for organising the rehabilitation process, acknowledges individual differences, employs optimal repetitions, and incorporates interspersed rest periods, all under the guidance of specialists and within suitable conditions regarding location, timing, and utilised tools, thereby affirming enhanced results. The researcher posits that the diverse rehabilitation exercises for the joint, grounded in scientific principles of rehabilitation, progressed from simple to complex and from static to dynamic, utilising both equipment and non-equipment methods, facilitated the treatment and enhancement of shoulder tendinitis and improved range of motion relative to the patient's condition. The potential regarding intensity and size, together with enhancements in the physical and motor capabilities of the arms, underscores that one of the primary objectives of rehabilitation activities is pain alleviation, given that pain is a prevalent complaint (Owen *et al*., 2020) [33]. The enhancement in shoulder strength and range of motion, together with the rates of improvement, is attributable to the monitoring and progression of rehabilitation activities (Dominguez-Romero *et al*., 2021) [17]. The enhancement of motor ranges is a critical variable that warrants attention, as the joint's movement in various directions encompasses the entire joint. The advancement in strength levels is attributable to the efficacy of the prescribed rehabilitation exercises and supplementary modalities, including yoga, resistance bands, and medicine balls, which contributed to strength enhancement. Furthermore, the incorporation of both dynamic and static exercises significantly influenced strength improvement (Mohsen, 2022; Cowin *et al*., 2022) [32, 13].

Conclusions

Considering the study's aims and the statistical analysis of the findings, the researcher arrived at the following conclusions:

1. Prepared rehabilitation activities positively enhance the functional performance of the shoulder joint.
2. The implementation of yoga activities was very successful in enhancing range of motion and strength, resulting in alleviation of soft tissue discomfort in the shoulder joint.
3. The workouts conducted favorably influenced muscular strength in the studied forms for the muscles associated with the afflicted joint.
4. The administered exercises significantly enhanced the range of motion of the afflicted area.

Recommendations

Subsequent to the presentation and analysis of the data, the researcher formulated the following recommendations:

1. It is preferable to utilise rehabilitation activities prescribed by a qualified rehabilitation expert or physiotherapist for injury rehabilitation.
2. Utilising diverse rehabilitation apparatus for the rehabilitation of sports injuries.
3. Focussing on the rehabilitation phase after the treatment time to expedite hospitalisation and facilitate a return to the venues.
4. The implementation of comprehensive rehabilitation activities, including yoga, together with specialised follow-up at the centre, yields exceptional outcomes for sports injuries in various sports.
5. Diligent care to the wounded individual, together with the implementation of workouts and subsequent monitoring to prevent problems.
6. Instructing athletes via courses on injury management and prevention.

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