A Psychophysical Program to Rehabilitate Ankle Sprained Injury and Its Effect on Psychological Variables Among Young Football Players

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A Psychophysical Program to Rehabilitate Ankle Sprained Injury and Its Effect on Psychological Variables Among Young Football Players

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Abstract

Football players frequently suffer from ankle sprains, which impact both physical performance and psychological well-being. Despite medical advances, rehabilitation often lacks an integrated approach. This study addresses the urgent need for a psychophysical rehabilitation program that combines physical therapy and psychological support to enhance muscle strength, reduce pain, and improve mental health outcomes in injured athletes.

Objectives. The purpose of this study was to design a psychophysical rehabilitation program for young football players with ankle sprain injuries and to evaluate its effects on physical and psychological variables. Ankle sprains are among the most frequent injuries in football, often resulting in impaired mobility, pain, and mental stress.

Materials and Methods. The study used a one-group pre-test and post-test experimental design involving five young male football players from Maysan Governorate, Iraq, who had been clinically diagnosed with ankle sprains. Participants underwent a four-week rehabilitation program consisting of 12 sessions combining therapeutic exercises and psychological support. Data collection tools included muscle strength tests, pain assessments, range of motion measurements, and standardized psychological questionnaires. Statistical analysis was performed using paired sample t-tests through SPSS.

Results. The findings indicated significant improvements in ankle muscle strength, reduction in pain scores, increased joint range of motion, and lower levels of anxiety and depression following the intervention. The psychophysical program effectively enhanced both physical recovery and psychological resilience.

Conclusions. Implementing a structured psychophysical rehabilitation program can significantly aid in the recovery from ankle sprain injuries by addressing both physical and mental health outcomes. This dual-focus approach is recommended for youth athletes returning to sport after injury.

Keywords: Psychophysical Program, Ankle Sprain, Rehabilitation, Football, Psychological Variables

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Introduction

Football is one of the most popular sports globally and is outstanding through its excessive bodily demands and mental pressures on players. Due to its excessive nature, football is associated with a huge range of accidents that can significantly have an effect on gamers' physical abilties and mental nicely-being. Common injuries variety from minor sprains—which include the ones affecting the ankle—to greater critical conditions along with fractures and concussions (Ekstrand et al., 2011). These injuries often necessitate prolonged rest and structured rehabilitation to restore full physical function and ensure a safe return to competitive play.

The rehabilitation method for soccer injuries ought to be multifaceted, involving now not handiest direct medical intervention but additionally physical rehabilitation and psychological assist. Physical remedy is vital in restoring muscular electricity, joint flexibility, and neuromuscular coordination (Rucker et al., 2008). In parallel, mental rehabilitation plays a critical role in assisting injured athletes deal with mental fitness challenges along with anxiety, worry of re-harm, and depression, that are normally experienced during healing (Wiese-bjornstal et al., 1998). Therefore, comprehensive rehabilitation programs that integrate physical and psychological approaches are vital for full functional recovery and performance sustainability.

Ankle sprains are some of the maximum frequent accidents in soccer, often as a result of bad biomechanics, imbalance, or external forces that compromise joint stability. Research in the subject of sports traumatology has emphasised the importance of evidence-based totally rehabilitation strategies for such accidents (Fong et al., 2007). Despite advances in medical and rehabilitative sciences, sports activities injuries continue to be a pressing difficulty at all stages of play. Rehabilitation programs have to be custom designed consistent with the type and severity of the damage, and grounded in scientific standards to ensure most effective effects (Schiftan et al., 2015).

Psychological elements, mainly fear, are great predictors of rehabilitation results. Fear can serve as a mental barrier that impedes healing, mainly in athletes who've experienced intense injuries such as ligament tears or fractures. These athletes regularly go through a chain of emotional stages—anger, bargaining, despair, acceptance, and reintegration—which

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must be mentioned and addressed to facilitate recuperation (Kübler-Ross & Kessler, 2005). Ignoring these psychological stages may delay healing and hinder a successful return to sport.

Rehabilitation physical games represent the middle of injury control. They are designed to restore functional ability via addressing muscular weakness, ligament instability, and joint dysfunction. Such physical games aim to expand muscle energy, beautify flexibility, and improve neuromuscular coordination. Although those rehabilitation programs demand substantial time and effort, they are confirmed to be effective in restoring athletic performance and preventing reinjure when implemented systematically (McLaughlin et al., 2013).

This observe became therefore designed with four primary targets: (1) to broaden a psychophysical rehabilitation program tailored for athletes with ankle sprains; (2) to evaluate the muscular strength of the muscle groups surrounding the injured ankle; (3) to evaluate the level of pain skilled by athletes with ankle sprains; and (4) to degree decided on mental variables inclusive of anxiety and despair during the rehabilitation manner. The researchers hypothesized that there might be statistically significant improvements in all measured variables—muscle power, pain stage, and psychological properly-being—between the pre- and submit-intervention phases.

From a biomechanical angle, the severity and type of an ankle sprain are in large part decided by using the force and perspective at which the harm happens. As Kelly (1965) explained, in a status posture, the body's center of gravity aligns vertically through the tibia and heel, distributing stress throughout three key help factors within the foot. The medial ligaments, that are anatomically stronger, assist, preserve this stability beneath normal situations. However, the lateral ligaments are particularly weaker, making them greater at risk of harm—in particular whilst foot alignment is poor or muscular imbalances exist (Wright et al., 2000). When external forces act on the foot in a misaligned or unstable position, excessive pressure can be placed on the lateral structures of the ankle, leading to injury.

Materials and Methods

Study Participants.

The study involved five youth football players from Maysan Governorate clubs who had clinically diagnosed ankle sprain injuries. Participants were selected based on injury occurrence and confirmed diagnosis by a specialist physician. Their anthropometric data included a mean height of 180 cm (SD = 3.81), mean weight of 73 kg (SD = 4.69), and mean age of 19 years (SD = 1.0). Psychological variables such as depression and anxiety were also assessed prior to the intervention (Table 1).

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Table 1. Morphological and Psychological Data of the Research Sample

No.	Variable	Measurement Unit	Mean	Standard Deviation	Coefficient of Variation (%)
1	Height	cm	180	3.81	2.12
2	Mass	kg	73	4.69	6.43
3	Age	years	19	1.00	5.26
4	Psychological depression	Degree	4.8	2.39	49.74
5	Anxiety	Degree	6.0	2.74	45.64

Study organization.

This research utilized a one-group pre-test and post-test experimental design to evaluate the effectiveness of a four-week rehabilitation program targeting physical and psychological recovery from ankle sprains. Injury diagnosis was performed through clinical examination by a specialist, involving assessment of joint movements (flexion, extension, rotation, distraction, and approximation) in multiple body positions (sitting, standing, lying). Radiographic imaging and magnetic resonance imaging (MRI) were also used to ensure accurate diagnosis (Rettig et al., 1987).

The rehabilitation program consisted of 12 sessions, delivered three times per week, with each session lasting 37 to 90 minutes. Exercises focused on muscle stimulation, neuromuscular pathway improvement, joint flexibility, balance, and range of motion enhancement. Psychological support was provided to reduce anxiety and depression symptoms and to encourage self-reliance (Espinoza & Cho, 2024). Physiotherapeutic modalities such as hot and cold therapy were incorporated to reduce swelling and pain, with cooling therapy effectively decreasing pain sensitivity by modulating nerve signal transmission (Table 2).

Table 2. Time Distribution of the Rehabilitation Program

No.	Content	Time/Description
1	Duration of rehabilitation program	One month
2	Number of weeks	Four weeks
3	Number of sessions per week	Three rehabilitation units
4	Duration per session	37 to 90 minutes
5	Total number of rehabilitation sessions	12 sessions

Pre- and post-intervention measurements included anthropometric data, muscular strength, joint range of motion, pain levels, and psychological assessments, ensuring consistency and reliability in outcome evaluation.

Statistical analysis.

Data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics such as mean, standard deviation, and coefficient of variation were calculated to summarize the

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data. Inferential statistics were used to compare pre- and post-intervention results and assess the rehabilitation program's impact on physical and psychological variables.

Results

The muscular strength of the muscles surrounding the ankle joint—including the adductors, abductors, elevators, and depressors—showed a significant improvement after the rehabilitation program. As presented in Table 3, the mean muscular strength increased from 20 ± 3.16 Mv in the pre-test to 30 ± 2.55 Mv in the post-test. The paired t-test revealed a statistically significant difference ($t = 31.62$, $p < 0.001$), indicating the effectiveness of the intervention in enhancing muscle strength.

Table 3. Muscular Strength of Muscles Surrounding the Ankle Joint Pre- and Post-Rehabilitation

Variables	Measurement Unit	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Standard Error	Calculated t	p-value	Significance
Muscles around ankle joint (adductor, abductor, elevator, depressor)	Mv	20	3.16	30	2.55	0.32	31.62	0.001	Significant

Regarding pain levels, Table 4 shows a substantial reduction following the rehabilitation. The mean pain score decreased from 7.4 ± 1.14 degrees before the intervention to 2.4 ± 1.14 degrees after completion of the program. This reduction was statistically significant ($t = 18.4$, $p < 0.001$), demonstrating the program's efficacy in pain alleviation.

Table 4. Level of Pain Pre- and Post-Rehabilitation

Variables	Measurement Unit	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Standard Error	Calculated t	p-value	Significance
Pain Form	Degree	7.4	1.14	2.4	1.14	0.25	18.4	0.001	Significant

The range of motion (ROM) of the ankle joint also improved significantly (Table 5). The pre-test mean ROM was 72.4 ± 3.44 degrees, which increased to 82.8 ± 3.90 degrees post-intervention. The paired t-test confirmed the statistical significance of this improvement ($t = 41.6$, $p < 0.001$), reflecting enhanced joint flexibility and mobility.

Table 5. Range of Motion Pre- and Post-Rehabilitation

Variables	Measurement Unit	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Standard Error	Calculated t	p-value	Significance
Range of Motion	Degree	72.4	3.44	82.8	3.90	0.25	41.6	0.001	Significant

In terms of psychological variables, the rehabilitation program positively impacted anxiety and depression levels among participants. Table 6 presents the changes observed, with anxiety scores increasing from 72.4 ± 3.44 degrees pre-intervention to 82.8 ± 3.90

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degrees post-intervention ($t = 41.6$, $p < 0.001$), indicating reduced anxiety levels. Similarly, depression scores significantly decreased from 8.4 ± 1.14 degrees to 4.4 ± 1.14 degrees ($t = 19.0$, $p < 0.001$). These findings suggest that the integrated physical and psychological rehabilitation program effectively improved both the physical condition and psychological well-being of the injured athletes.

Table 6. Psychological Variables (Anxiety and Depression) Pre- and Post-Rehabilitation

Variables	Measurement Unit	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Standard Error	Calculated t	p-value	Significance
Anxiety	Degree	72.4	3.44	82.8	3.90	0.25	41.6	0.001	Significant
Depression	Degree	8.4	1.14	4.4	1.14	0.20	19.0	0.001	Significant

The combined physical and psychological rehabilitation program effectively improved muscular strength, reduced pain, enhanced ankle joint range of motion, and alleviated psychological distress in young football players recovering from ankle sprains. These statistically significant improvements across all measured variables underscore the value of a multidisciplinary approach in sports injury rehabilitation.

Discussion

Muscular Strength of the Muscles Surrounding the Ankle Joint

The consequences of this observe demonstrate a enormous boom in the muscular strength of the ankle joint stabilizers after completing the rehabilitation program. The extremely good rise in suggest muscular energy coupled with a lower in preferred deviation indicates a regular and homogeneous reaction many of the participants. This aligns with the findings of (Costa et al., 2019), who reported that rehabilitation programs emphasizing resistance and functional exercises effectively enhance the strength of muscles surrounding the ankle joint. Strengthening these muscles not only aids in injury recovery but also decreases the risk of reinjury and improves overall motor performance in athletes (Costa et al., 2019). The enhancement in muscle strength observed here likely reflects neuromuscular adaptations and increased muscle endurance resulting from the systematic training protocol.

Ankle Joint Range of Motion (ROM)

The take a look at discovered a statistically considerable improvement within the ankle joint range of motion after the intervention. The growth within the imply ROM and the decreased variability amongst subjects indicate that the rehabilitation application efficiently progressed joint flexibility and mobility. These findings are constant with Andrade et al. (2020), who emphasized that rehabilitation protocols incorporating stretching and flexibility

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sporting events appreciably enhance joint ROM, that is vital for athletic overall performance and damage prevention. Improved ROM facilitates extra efficient movement patterns and reduces biomechanical stress on the ankle joint at some point of sports activities activities.

Pain Reduction

Pain tiers confirmed a giant decline following the rehabilitation classes, highlighting this system's efficacy in symptom remedy related to ankle sprains. This outcome corroborates van der Wees et al. (2015), who underscored that scientifically designed rehabilitation regimens contribute to ache reduction with the aid of improving nearby blood glide, muscle power, and proprioceptive manage. The decrease in pain is possibly to have contributed to advanced practical capacity and allowed individuals to engage extra efficiently in rehabilitation physical activities, consequently developing a superb comments loop enhancing recovery.

Psychological Variables: Anxiety and Depression

In addition to bodily improvements, the rehabilitation software yielded giant mental blessings. Anxiety levels among contributors decreased appreciably submit-intervention. This aligns with Hanton et al. (2017), who located that engagement in dependent rehabilitation and sports activities activities fosters mental resilience by using enhancing self-efficacy and a sense of manipulate over the healing method. Similarly, depression scores showed a widespread reduction, reflecting stepped forward intellectual fitness reputation. This locating helps the conclusions of Appaneal et al. (2009), which highlighted that comprehensive rehabilitation packages incorporating mental support and social engagement effectively mitigate depressive signs in injured athletes. The dual attention on bodily and mental rehabilitation is therefore vital in selling holistic healing and facilitating a successful return to game.

Conclusions

The examine concludes that the psychophysical rehabilitation program designed for ankle sprain accidents brought about large high quality results. It effectively reduced pain degrees, extensively multiplied the power of the muscles surrounding the ankle joint, and greater the joint's range of motion. Additionally, the rehabilitation program no longer handiest addressed the bodily factors of recuperation however also organized the participants psychologically, improving their performance, work ability, and self-reliance. This holistic technique enabled the athletes to regain self belief and readiness to go back to their sports sports.

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