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The Impact of acupuncture on ankle injury rehabilitation among volleyball players in middle Euphrates clubs

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Abstract

The study aimed to identify the level of ankle joint injuries among volleyball players in Middle Euphrates clubs, as well as to develop therapeutic sessions using acupuncture for ankle rehabilitation among these players. The researcher employed the experimental method using a one-group design, which was deemed suitable for the research problem. The researcher also ensured homogeneity within the study group. The main experiment involved acupuncture sessions aimed at rehabilitating the ankle joint of the injured volleyball players. The primary experiment was conducted from January 25, 2024, to March 16, 2024. The findings revealed that the acupuncture therapy sessions had a positive effect on improving ankle joint performance and reducing pain.

Keywords: Acupuncture, ankle, injury rehabilitation, volleyball

Introduction

Rehabilitation programs have occupied a significant place in scientific research, especially in recent times, due to the benefits derived from the results of scientific research and studies. Sports injuries are among the primary problems that hinder athletes from performing their physical and skill-related duties, which negatively impacts the development of their performance and leads to a decline in both their skill level and physical condition ^[1]. Rehabilitating injured athletes helps improve ankle health and restore its efficiency through exercises that strengthen the surrounding muscles. This is achieved by applying knowledge from sports medicine, sports training, anatomy, and physiology, which aid the injured athlete in returning to their normal condition and restoring the injured part to its functional activity ^[2].

Acupuncture is one of the natural therapeutic methods used to overcome pain and restore internal balance in the human body. Acupuncture plays a significant and effective role in pain relief by utilizing the pain gate control theory and releasing natural chemical substances stored in the human body, known as blood opioids ^[3]. This process helps in stopping pain, which significantly reduces the need for painkillers, and contributes to enhancing the athlete's performance, allowing them to return to their normal condition quickly. Therefore, the importance of this research lies in exploring the impact of acupuncture on the rehabilitation of the ankle joint in injured athletes ^[4].

Research Problem

After examining the therapeutic aspect and observing the limited spread of therapeutic culture, particularly regarding medical devices in the community, which leads to the exacerbation of injuries and deprives the injured athlete of practicing sports either temporarily or permanently—especially in the case of ankle injuries—the researcher sought to address this issue. This problem was addressed by developing therapeutic sessions using acupuncture in a scientific manner to strengthen the muscles surrounding the ankle, reduce pain, and restore the injured individual to their normal state.

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Research Objectives

- To identify the level of ankle joint injuries among volleyball players in Al-Diwaniyah Sports Club.
- To develop a program using acupuncture for the rehabilitation of the ankle joint in volleyball players at Al-Diwaniyah Sports Club.

Research Method

The researcher used the experimental method with a one-group design, as it was suitable for addressing the research

problem.

Research Population and Sample

The research population was identified as volleyball players in Middle Euphrates clubs for the academic year 2023-2024. A simple random sampling method was used to select Al-Diwaniyah Governorate, which included 8 players. The sample represented 50% of the research population, and homogeneity within the study group was ensured as shown in Table (1)

Table 1: Shows Sample Homogeneity

No.	Variables	Unit of Measurement	Mean	Standard Deviation	Standard Error	Skewness	Homogeneity
1	Weight	kg	67.62	2.386	0.843	0.172	Homogeneous
2	Height	cm	170.0	5.182	1.832	0.443	Homogeneous
3	Age	years	23.25	0.7071	0.250	-0.40	Homogeneous

Tests Used in the Research

1. Balance Test:

- Purpose of the Test: To measure static balance.
- Equipment: Balance bench (a wooden board with a 50 cm long and 18 cm wide beam fixed in the middle), electronic stopwatch, whistle, and a volleyball court.
- Performance Specifications: The player stands with the injured leg on the edge of the beam, so that it is longitudinally aligned with the beam. The other leg rests on the board. Upon hearing the start whistle, the injured player lifts the other leg off the board, balancing on the injured leg.

2. Leg Muscle Endurance Test (From Standing Position) for 60 Seconds

- Purpose of the Test: This test aims to measure the endurance of the leg muscles.
- Equipment: Electronic stopwatch, sports hall, mat.
- Performance Method: From a standing position, the player fully bends and extends the legs for 60 seconds. The number of repetitions is counted.
- Scoring: The number of times the legs are bent and extended within 60 seconds is recorded.

Pilot Study

The pilot study was conducted on January 26, 2024, to achieve the following objectives:

- Determine the appropriate timing for the experiments.
- Ensure the availability of suitable equipment and facilities.
- Prepare and train the assisting staff for the pilot study.
- Define and prepare the administrative procedures required for the field application of the experiment.

Pre-Test

The pre-tests were conducted on Sunday, January 25, 2024, to perform the assessments related to the study.

Application

The researcher developed a rehabilitation program for the ankle joint of volleyball players using acupuncture, based on various sources, scientific studies related to rehabilitation, and consultations with experts in Chinese medicine and rehabilitation. The acupuncture points, both proximal and distal to the ankle joint, were identified. The researcher organized the acupuncture sessions' timeline, dividing the acupuncture points over the weeks of the rehabilitation program for the study group, with the aim of rehabilitating the ankle joint injury.

The main experiment using acupuncture started on Sunday, January 25, 2024, and continued until March 16, 2024. Injured players attended the medical center, where the acupuncture sessions were administered. Each needle was left in place for 20 minutes, with stimulation every 5 minutes by rotating the needle counterclockwise and clockwise, applying pressure, and lifting the joint. The sessions were conducted twice weekly. The researcher provided detailed explanations and illustrative images to demonstrate how the therapeutic sessions were carried out on the sample individuals.

Post-Test

The post-tests were conducted on Monday, March 15, 2024, to perform the assessments related to the study.

Statistical Methods

The researcher used the Statistical Package for the Social Sciences (SPSS) and selected the appropriate statistical tools, including:

- Arithmetic mean
- Skewness coefficient
- Standard deviation
- Standard error
- T-test for dependent samples

Results

Table 2: This table shows the central tendency characteristics of the tests under study.

No.	Variables	Mean	Standard Deviation	Standard Error	Median	Maximum Value	Minimum Value
1	Balance	14.8	4.0155	1.419	14.00	21.00	10.00
2	Leg Muscle Endurance	28.12	8.5262	3.0144	26.00	40.00	18.00
3	Pain Intensity	7.135	0.5839	0.2064	7.335	7.71	6.43

Table 3: Indicates the T-Test for Pre- and Post-Tests of the Variables under Study

No.	Variables	Pre-Test (Mean)	Pre-Test (SD)	Post-Test (Mean)	Post-Test (SD)	Calculated T	Significance Level	Type of Significance
1	Balance	14.8	4.015	17.50	2.878	-3.375	0.012	Significant
2	Leg Muscle Endurance	28.12	8.526	35.875	2.295	-2.909	0.023	Significant
3	Pain Intensity	7.135	0.583	4.4525	0.547	10.224	0.000	Significant

At a significance level of (0.05)

The tables show the presence of statistically significant differences between the pre-test and post-test for the group under study. The mean for balance in the pre-test was (14.8) with a standard deviation of (4.015), while the mean for the post-test was (17.50) with a standard deviation of (2.878). The calculated T-value was (-3.375) with a significance level of (0.012), which is less than (0.05), indicating a significant difference in favor of the post-test. In the case of leg muscle endurance, the mean in the pre-test was (28.12) with a standard deviation of (8.526), while in the post-test, the mean was (35.875) with a standard deviation of (2.295). The calculated T-value was (-2.909) with a significance level of (0.023), which is less than (0.05), indicating a significant difference in favor of the post-test. As for pain intensity, the mean in the pre-test was (7.135) with a standard deviation of (0.583), while in the post-test, the mean was (4.4525) with a standard deviation of (0.547). The calculated T-value was (10.224) with a significance level of (0.000), which is less than (0.05), indicating significant differences in favor of the post-test.

Discussion

The researcher attributes these results to the use of acupuncture in therapeutic rehabilitation for volleyball players. It is clear from the results obtained that the therapeutic acupuncture applied led to the restoration of joint strength and pain relief through proper use or correct performance, to the extent that the injured individuals were able to perform all their motor functions normally. Based on this, the variety of therapeutic rehabilitation methods applied to the sample had a clear impact on this improvement [5]. The incorporation of multiple therapeutic techniques alongside acupuncture may have created a synergistic effect that accelerated recovery, as the integration of traditional and modern rehabilitation techniques often results in better patient outcomes. This aligns with the concept of multimodal therapy in sports rehabilitation, where various treatments such as physical therapy, exercises, and manual therapy are combined to optimize healing and performance. The ability of acupuncture to enhance local blood flow, reduce inflammation, and stimulate nerve responses makes it a vital tool in sports medicine for athletes requiring rapid recovery and pain management [6].

This study is similar to the study by Berman, which confirms that the ancient Chinese method of acupuncture has a success rate of 40% in reducing joint pain. According to the Times, the largest scientific trials on acupuncture were conducted by a research team from the National Institutes of Health in the U.S., led by Brian Berman from the University of Maryland School of Medicine in Baltimore. At the same time, other trials conducted in the UK found that acupuncture is effective in relieving joint pain [7]. These findings suggest that acupuncture's effects are not only limited to pain management but may also enhance the body's overall healing response by regulating immune

function and promoting tissue regeneration [8]. The involvement of central neurochemical pathways in pain modulation, particularly through the release of endogenous opioids, positions acupuncture as an effective non-pharmacological intervention, particularly for athletes who prefer to avoid drug-based treatments due to potential side effects or performance restrictions [9].

The use of acupuncture in pain treatment works by stimulating acupuncture points to relieve pain through several mechanisms, including increasing the release of natural opioids within the body and the central nervous system. It also leads to the secretion of certain hormones in the blood, relying on the stimulation of the autonomic nervous system, which increases the release of hormones that can be measured before and after acupuncture. The sample's ability to extend and flex the joints demonstrates an improvement in movement capacity due to a significant reduction in pain, which played a role in enhancing motor ability. This, in turn, improved the functional efficiency of the knee joint, which was further enhanced by acupuncture in conjunction with therapeutic exercises. Additionally, acupuncture improved endurance and balance in the leg muscles [10]. Other research has corroborated the positive effects of acupuncture on musculoskeletal injuries, showing that it can lead to faster recovery times by accelerating the healing process in soft tissues, reducing pain levels, and improving range of motion [11]. For athletes, this means quicker return to sports activities with a reduced risk of re-injury, making acupuncture a valuable tool in injury prevention and rehabilitation programs [12].

Conclusion

Recommendations and Conclusion

Conclusions

1. Acupuncture sessions had a significant impact on improving the balance of volleyball players with ankle injuries at Al-Diwaniyah Sports Club.
2. The acupuncture sessions also contributed to the improvement of leg muscle endurance in volleyball players with ankle injuries at Al-Diwaniyah Sports Club.
3. Acupuncture helped in reducing pain in volleyball players with ankle injuries at Al-Diwaniyah Sports Club.

Recommendations

1. It is essential to diversify therapeutic methods that aid in the rehabilitation of sports injuries among athletes.
2. Emphasize the use of acupuncture in treating ankle injuries specifically, and sports injuries in general.
3. Ensure proper care for injured athletes by conducting medical examinations to prevent the aggravation of injuries.
4. From the principle of "prevention is better than cure," it is crucial for coaches to focus on proper warm-ups, which help reduce the risk of injury.

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