

***The effectiveness of sports rehabilitation using balance exercises in the aquatic environment to improve The degree of pain and some physical variables of ankle joint injury***

***\* A.D/ Nasser Mustapha Al-suwaifi***

**\* Professor Education Health care Department Science Health Sportsmanship - Faculty Education Sportsmanship - University Minya .**

***\*\* A.M.D/ Abdulrahman Mansour Abdul Jaber***

**\*\* Professor Assistant Department Science Health Sportsmanship - Faculty Education Sportsmanship - University Minya .**

***\*\*\*The researcher/ Omran Salah Ali Muhammad***

**\*\*\* Researcher Department Science Health Sportsmanship - Faculty Education Sportsmanship - University Minya .**

**Introduction And a problem Search :**

Balance is the key to all movements that occur quickly, for example, changing direction, it happens Quickly through the musculoskeletal system and cerebral nerves, the interactions are integrated by the brain, which directs He adds that balance training is important and the better the balance, the more it happens . communication between muscles, nerves and brain in a faster way (7 :84).

The ability of the joint to sense the place and came to the conclusion that balance exercises work to raise the ability of the player has to perform the movement with sensory information of the movements being performed (4 : 35).

The patient is trained to restore functional ability in the shortest possible time using the following methods Physiotherapy that is appropriate to the type and severity of the injury and this is known as rehabilitation, the importance of Rehabilitation exercises have two main goals, namely the Prevention of various sports injuries and the return of The player returns to the competition arena with the same functional and physical competence as he was before the injury occurred and as soon as possible (5 : 67) .

Hydrotherapy exercises have many characteristics, the most important of which is the property of buoyancy in water where It makes the body suspended, so achieving balance is easier and makes the risk of falling less, which gives the patient More confidence in the work of exercises , the density of water is more than the density of air and this makes its resistance greater when the patient performs exercises that increase muscle strength faster than doing exercises in the air (2 : 130).

From the above, the researcher notes that the characteristics of training in the aquatic environment it reduces the weight of The player relieves pressure on the affected joints, the weight may decrease in the water and reach ٢٠% of Its original weight, this is what makes training in the aquatic environment safer and preserves the safety of the player . It is also possible to perform metered exercises to enter the aquatic environment with or without tools, they help To achieve the desired goal and increase muscle strength .

The risk of a regenerative ankle injury is also increased especially among athletes, by almost a third Patients suffer from another ankle injury in a matter of 3 years , and for athletes in general And football players especially this rate reaches a high of 73% of all cases, later Many patients complain of reduced ankle flexibility and pain during walking and running Slight swelling and mild instability of the ankle joint .

Looking at the medical records and reports of the injuries of players in the junior sector found Frequent injury of anterior and posterior fibular ankle ligament rupture due to many reasons, including ground Stadiums or colliding with an opponent forcefully , and after the players recover and physically rehabilitate and return to the stadiums once In addition, many of them suffer from repeated ligament ruptures, and some of them suffer from instability Joint and repeated twisting, both externally and internally .

From the above, the researcher found the scientific and applied importance of this research , which aroused their motivation to do this Research as an attempt to design a sports rehabilitation program using balance exercises in the aquatic environment to feel The degree of pain and some physical variants of ankle joint injuries .

### **Research objective :**

The research aims to design an athlete's rehabilitation using balance exercises in the aquatic environment And identify its effectiveness in improving the degree of pain and some physical variables (agility, muscle strength , Balance) for ankle joint injuries .

### **Research assignments :**

1. There are statistically significant differences between the tribal and dimensional measurement averages of the group under consideration in the degree of Pain is in favor of telemetry .
2. Statistically significant differences exist between the tribal and dimensional measurement averages of the group under consideration in some Physical variables (agility, muscle strength, balance)} in favor of telemetry .

**Search procedures :****Research methodology :**

Researcher used the experimental approach using the experimental design of one group, applying Tribal and dimensional measurement of the group due to its relevance to the nature of the research .

**Community and sample research :**

The research community represents players with torn ankle ligaments of the anterior personal ligament and the adult-and the obstacle I have for the junior football sector of Z Sports Club for the training year (2022) . The number of (9) players, and the researchers deliberately selected the research sample from the Z club teams (2003-2004-2005-2006) and those with torn ankle ligaments of the first degree - baby boomers , A number of (6) players were selected as a survey sample , and a player was excluded for non-compliance with the instructions . The qualifying program was applied to a number of (5) players .

**Means of data collection :**

First : tests of physical variables :

Researcher conducted an expert opinion poll on the tests on a group of experts and their number (7) experts in the field of physical education .

The researcher was satisfied with a percentage of 90% or more of the experts ' opinions on the elements of rehabilitation The athlete is under consideration , and the percentage of expert gentlemen's opinions on the tests under consideration has varied (57% : 100%) , and thus the test (100m enemy) was excluded because it did not get a percentage (70%) From the opinions of experts.

**Scientific transactions of tests :****A. honesty :**

Researcher points out that the tests used in this research have been applied in many researches It has received high honesty coefficients , and this leads to its content, and to calculate the honesty, the researcher A sample of players was selected consisting of (6) two players and divided into two groups, one of them with an injury . The honesty of differentiation of variables was calculated , and the results yielded . There are statistically significant differences between the group with moderate injury and the group with injury . In favor of the group with an average incidence, which indicates the ability of the tests To distinguish between different groups .

**B constancy :**

To calculate the stability of the tests under consideration, the researchers used the method of applying and reapplying the test . This is based on a sample of (6) players from outside the research sample and with an interval of (3) three days between (0.91 : 0.97) which are transactions: the two applications, and the correlation transactions between the two applications ranged between is statistically correlated, which indicates the constancy of the tests .

**Third: the rehabilitation program using balance exercises in the aquatic environment :****1- the goal of the program :**

The proposed program aims to :

- Improve the functional efficiency of ankle joint sufferers .
- The contribution of aqua aerobics to the rehabilitation of injured people in the ankle joint .

**2- program purposes :**

- The program takes into account the research sample in terms of growth stages, players ' abilities and previous experience in In terms of physical and skill content .
- Observing the principle of gradualness is from easy to difficult .
- Taking into account security and safety factors .
- Observe the load balance between work and rest .
- Observe the balance in the use of working muscles in exercise .

**3- program content :**

The program contains many exercises that have been divided into five stages and for each stage One of its stages has a criterion for moving from one stage to another, so that the player undergoes a period of (8) weeks with a reality (3) units per week, and the intensity of exercise has varied to restore motor range as well as exercise development) Bernus the muscular strength of the working muscles around the ankle joint, especially the long fibula muscle . Long longs for muscles . Gastro leg gastro . Muscle anterior tibial muscle . muscle lower muscle . During resistance training with rubber ballistics when rotating in and out, forward and backward .

**4- stages of the program :****Initial stage :**

Objectives of the first stage :

1. This stage serves to reduce the tumor .
2. Reduce the feeling of pain .
3. Restoration of motor range .

**The second stage :**

Objectives of the second stage :

1. Focus on the development of muscular strength of all the muscles surrounding the ankle joint .
2. Focus on stretching the muscles that are around the joint .
3. Attention to the development of static balance .

**The third stage :**

Objectives of the third stage :

1. The variety is in the use of different muscle contractions .
2. Increase the ability to keep balance .
3. Development of muscular strength of the working muscles around the ankle joint .

**Fourth stage: (return to the stadium)**

Objectives of the fourth stage :

1. Attention to the performance of all technical and physical motor skills, taking into account the gradation in the degree of difficulty in Performance .
2. Return to the field gradually .

**Presentation, interpretation and discussion of results :****Schedule (1)****The significance of the differences between the average grades of the two tribal and dimensional measurements in the degree of pain (n =5)**

Variants	Average Measurement Tribal	Average Measurement Dimension	Average Ranks	Total Ranks	Direction	z signal value	Probability
The mistake	7.60	0.40	3.00 0.00	15.00 0.00	+5 - Zero = Zero	2.12 *	0.034

\* at the level of (0.05)

\*\* at the level of (0.01)

The table (1) shows the following :

- There are statistically significant differences between the average grades of the average grades of the tribal and Post-Standard For the group under consideration the degree of pain in favor of telemetry .

## Schedule (2)

**The significance of the differences between the average grades of the tribal and dimensional measurements in the physical variables (n =5)**

Variants	Average Measurement Tribal	Average Measurement Dimension	Average Ranks	Total Ranks	Direction	z signal value	Probability
barbarian agility	3.20	7.40	0.00 3.00	0.00 15.00	+ Zero - 5 = Zero	2.06 *	0.039
Wide jump of the revolution	1.52	2.26	0.00 3.00	0.00 15.00	+ Zero - 5 = Zero	2.12 *	0.034
Standing on me one-leg	20.79	13.66	0.00 3.00	0.00 15.00	+ Zero - 5 = Zero	2.02 *	0.043

\* at the level of (0.05)

\*\* at the level of (0.01)

The table (2) shows the following :

- There are statistically significant differences between the average grades of the average grades of the tribal and Post-Standard For the group under research in physical variables in favor of telemetry .

The researchers attribute this result to the fact that the result of relying on metered rehabilitation programs led to Improving the physical and functional aspects of the research sample, the practice of metered rehabilitation exercises leads to Improving the functional states of the player, the nature of physical exertion leads to an improvement in the level of the player and works To improve all his body systems and help him perform his functional and skill duties efficiently and easily ، Many studies have proven the important role of legalized sports rehabilitation in improving physical fitness The player's career and its ability to improve the player's level in all physical and psychological aspects As well as skill .

The researchers also tried to focus on developing flexibility and lengthening the ankle joint, as well as the importance of the flexibility element as an effective element in preventing injuries, and that the flexibility element must be developed when developing the muscle strength element, but with care to choose exercises that work to increase muscle strength so that it works to lengthen the muscles at the same time. Time, as increasing the range of motion of the joint will lead to an increase in the force resulting from the contraction of the muscles working on it without

directly developing muscle strength. Therefore, before developing muscle strength, we must work on developing flexibility for the joint and lengthening the muscles working around this joint in order to avoid difficulty in moving the joint.

Therefore, the researchers used the wooden balance device not only in rehabilitation, but in improving the work of the autoreceptors located in the joint and at the end of the muscles, thus developing balance and the ability to judge movement, and thus the interest in developing muscle strength and balance.

This was confirmed by the study of "Asimonia et al" (2013) (1), the results of which indicated an improvement in the ability of the injured leg in the two groups. There were no differences between the two research groups in the rehabilitation program using balance exercises inside or outside the water.

And the study "Bridey-Lee, Lynette Crous, Quinette Louw, Momberg" (2008) (3), the results of which indicated the positivity of the proposed training program in improving the three cases and reducing their pain.

And the study of Michael Hobbs (2008) (6), the results of which indicated that dynamic balance affects the ability of players to play. The three devices can measure balance and indicate the extent of the players' ability to play basketball.

The study "Timothy & et al" (2006) (8), the results of which indicated a lower rate of ankle sprains in the experimental group than the control group, emphasized the need to pay attention to balance training because it reduces the rate of ankle ligament tear injury.

### **Conclusions:**

- 1-The effect of the rehabilitation program using balance exercises in water in reducing the degree of pain for players with ankle joint injuries.
- 2-The effect of applying the rehabilitation program using balance exercises in water on improving the physical variables of agility, muscle strength, and balance among the sample members under study.
- 3-There are statistically significant differences between the averages of the pre- and post-measurements for the group under study in the degree of pain in favor of the post-measurement.
- 4-There are statistically significant differences between the averages of the pre- and post-measurements for the group under study in some physical variables (agility, muscular strength, balance) in favor of the post-measurement.

**Recommendations:**

1-Paying attention to implementing the proposed rehabilitation program based on balance exercises in the water environment because of its ability to raise the level of the injured player in all variables.

2-Paying attention to standardized rehabilitation programs for football players that contribute to improving the physical and skill aspects and preventing the injury from recurring frequently.

3-Being guided by scientific foundations in building and designing rehabilitation programs to raise the physical and skill levels of football players.

4-Sports clubs pay attention to the availability of advanced gyms in order to record physical and physiological data and carry out sports rehabilitation when necessary.

the reviewer

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## Research Summary

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the researcher notes that the characteristics of training in the aquatic environment it reduces the weight of The player relieves pressure on the affected joints, the weight may decrease in the water and reach ٢٠% of Its original weight, this is what makes training in the aquatic environment safer and preserves the safety of the player . It is also possible to perform metered exercises to enter the aquatic environment with or without tools, they help To achieve the desired goal and increase muscle strength . The risk of a regenerative ankle injury is also increased especially among athletes, by almost a third Patients suffer from another ankle injury in a matter of 3 years , and for athletes in general And football players especially this rate reaches a high of 73% of all cases, later Many patients complain of reduced ankle flexibility and pain during walking and running Slight swelling and mild instability of the ankle joint . Looking at the medical records and reports of the injuries of players in the junior sector found Frequent injury of anterior and posterior fibular ankle ligament rupture due to many reasons, including ground Stadiums or colliding with an opponent forcefully , and after the players recover and physically rehabilitate and return to the stadiums once In addition, many of them suffer from repeated ligament ruptures, and some of them suffer from instability Joint and repeated twisting, both externally and internally .