Swimming as a Means of Recovery From Injuries and Maintaining/Improving General Physical Condition in Soccer Players

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Abstract
Introduction: The rigors of practicing a performance sport require participation in both intense training and competitions. Thus, the increased physical demands leave their mark on the athletes regardless of how well they are prepared. In these conditions, restoring the body after exercise is essential for obtaining the desired results and for avoiding injuries or overtraining. *Objectives*: The tasks of this study are oriented in the following directions: the opinion of football players on the effectiveness of using swimming as a means of recovery of the body after exertion, as a means of recovery of the body after injuries and as a means of improving the general physical condition. *Materials and methods*: To achieve the research objectives, a quantitative study was carried out in which the opinion of football players on swimming, as a means of recovery after effort, was followed. The questionnaire, made with the help of the Google Forms application, composed of 10 questions, was distributed to football players registered with football teams that regularly participate in championship games, in different leagues in Romania. *Conclusions:* Following the analysis of the answers obtained, we find that, although the respondents are aware that swimming and water activity bring many benefits as means used by football players in recovery after effort, in recovery after injuries, respectively for maintaining/improving the general physical condition, this type of recovery is not used sufficiently by the respondents, the main reasons mentioned by the respondents being the lack of adequate infrastructure and the costs being too high.

Keywords*: swimming, footbal, players, opinion.*

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1. Intoduction

The fact that swimming is an activity that can be practiced at any age gives its forms a universal attribute. Sedentarism is one of the predominant characteristics of modern lifestyles. Physical activity successfully combats the harmful effects of a sedentary lifestyle, swimming being one of the most popular physical activities, which also provides multiple beneficial effects. It is also well known that practicing different physical activities has not only physical benefits but also social benefits, which facilitate the interaction between people with similar hobbies. (Waller et al. 2014) (Stoychevski 2021)

Swimming can be a safe option for people suffering from various conditions such as arthritis, various injuries, various types of disabilities, other types of problems that limit the use of high-impact exercise. (Boltz et al. 2021) (Van Beijsterveldt et al. 2013)

In terms of swimming strokes, swimming can be practiced using both the competitional stroke techniques (effective) and the folk stroke techniques (less effective). (Parvis et al. 2016)

According to an article published on the International Water Sport Federation's website, specialists recommend casual swimming for 150 minutes a week or 75 minutes vigorously, as it is an excellent way to activate the whole body and stimulate the cardiovascular system, having minimal impact on muscles and joints. According to the article, swimming is one of the most popular physical activities in the United States because of its main benefits: improves cardiovascular performance without stressing the body; tones the entire muscular system; improves overall fitness by increasing strength and endurance. (Waller et al. 2014)

Aquatic therapy consists of a variety of water-based exercise programs. This type of therapy is beneficial for a wide variety of ailments and medical conditions. One of the main benefits of water activity is weight relief due to the buoyancy given by submerging the body into the water. This upward force reduces the weight felt by the body, as the stress forces acting on the body's support apparatus are reduced. (Bălan and Mitrea 2017) (Tate et al. 2020)

Water density is a very good source of resistance that can easily be incorporated into an aquatic therapy exercise program. Water resistance allows muscles toning without the use of weights, allowing various muscle

groups to work with reduced joint stress, a result which cannot be achieved outside the water. (Shi et al. 2018) (Sokołowski, Strzała, and Radecki-Pawlik 2022)

Water temperature can also play a very important role in the results of aquatic therapy. An appropriate water temperature produces vasodilation, increasing blood flow to the affected areas, which helps patients with muscle disorders recover faster. (Shell et al. 2020) (Zarzeczny, Kuberski, and Suliga 2022)

2. Hypothesis

By conducting this study, we aim to find out the opinion of football players regarding the use of swimming as a means of recovery after specific effort.

The starting hypothesis is that the majority of the respondents consider swimming to be effective as a means of body recovery after effort, as a means of body recovery after injury and as a means of maintaining/improving general fitness.

3. Materials and methods

In order to achieve the research objectives, a quantitative study was carried out in which the opinion of football players on swimming as a means of recovery after exercise was followed. The questionnaire, made with the help of Google Forms application, was composed of 10 questions and was distributed to football players affiliated to football teams participating regularly in championship games in different leagues in Romania. Several research methods were used to conduct the present study:

Bibliographic study - was used to search, find, sort and verify relevant information about the research topic. The main bibliographical sources used within the study were: websites with general information about swimming, information related to the use of swimming in recovery after exercise, recovery after injury and improvement of general fitness.

Graphical representation method - this method was used to make the information presented easier to understand, as the written information was illustrated into charts. Due to the variety of charts, this tool has great versatility of use. In the present study the graphical representation method was used less in the introductory part, but it was used in the special part of the paper, for the illustration of the data about the respondents and the data obtained.

Statistical-mathematical method - method used to accurately describe the studied phenomena, by which information is concentrated, it is easier to synthesize, the results obtained are clearly interpreted, and conclusions about the studied phenomenon can be formulated. In this study, the statistical-mathematical method was used to interpret the responses obtained, using statistical indicators such as mean, median, standard deviation, minimum and maximum.

Questionnaire survey method - is the most widely used method concerning data collection, the instrument used being the questionnaire. For the present study a questionnaire was designed, made with the help of Google Forms application, consisting of 10 questions oriented to the following types of data:

- Data about the respondent (gender, age category, level of the league in which the team where he/she is enrolled plays);
- Respondents' opinion on the effectiveness of swimming as a means of recovery after effort, as a means of recovery after injuries and as a means of improving general fitness;
- Information on the use of swimming as a means of recovery after exercise, as a means of recovery after injury and as a means of improving general fitness;
- Information on the reasons why swimming is not used as a means of recovery from effort, as a means of recovery from injury and as a means of improving general fitness.

The ten questions that make up the questionnaire have been arranged in a logical sequence, their typology being varied: closed questions with a choice of one or more answers, opinion questions and open questions.

The Excel tool from the Microsoft Office Professional Plus 2016 suite was used to generate the charts and perform the statistical calculations.

4. Results

Given that the number of respondents was 136, the margin of error of the results obtained is +/-8.4% at a confidence level of 0,05.

The gender of the respondents is shown in the chart below: 106 respondents (77.9%) are male and 30 respondents (22.1%) are female.

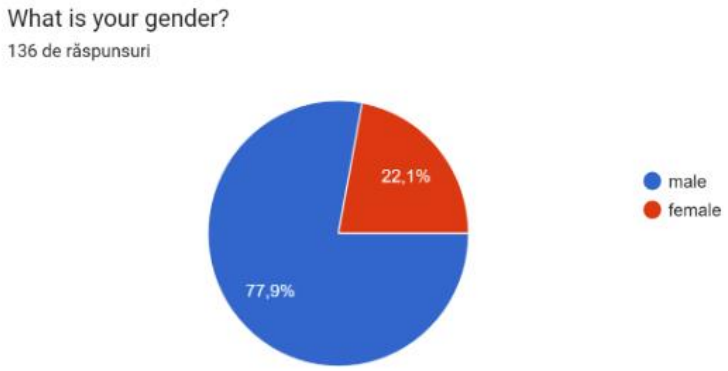

Chart 1. Gender of the respondents

The age categories of the respondents are shown in the following chart:

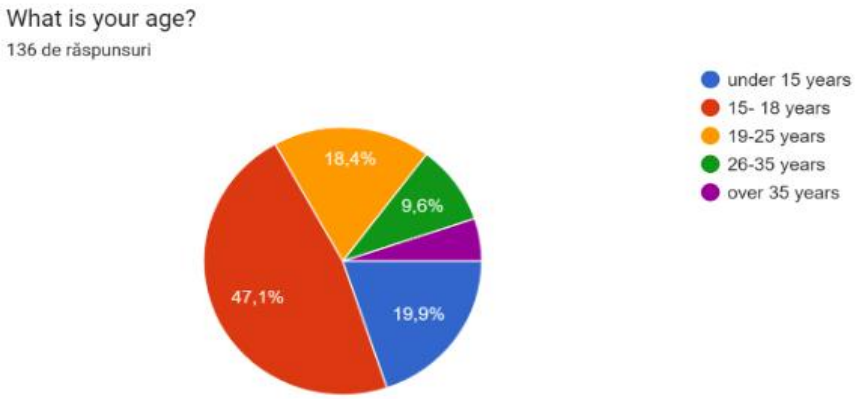

Chart 2. Age category of the respondents

Most of the respondents, 64 (47.1%), belong to the 15-18 age category. The under 15 age category is represented by 27 respondents (19.9%). The 19 - 25 age category is represented by 25 respondents (18.4%). The 26 - 35 age category is represented by 13 respondents (9.6%) and the least represented category is the over 35 years old, with 7 respondents (5.1%).

Concerning the level of the league in which the respondents play/have played, the responses received are shown in the chart below:

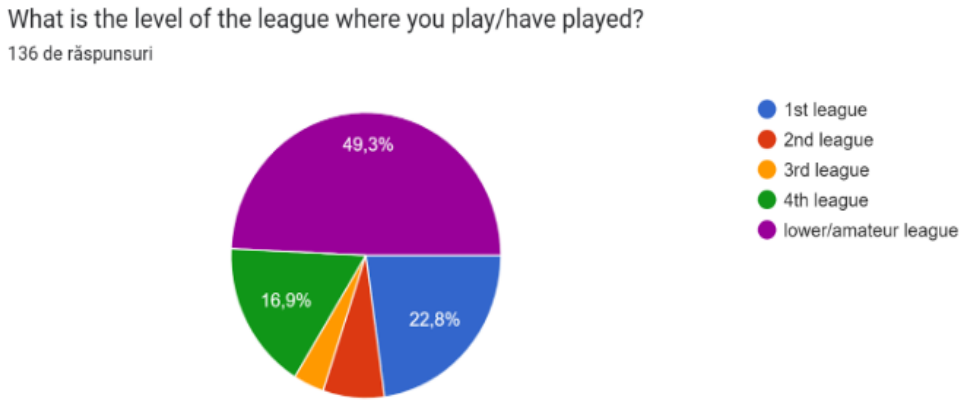

Chart 3. Level of the league where the respondents play/have played

Most of the respondents, 67 (49.3%) play or have played in the lower/amateur leagues. 31 of the respondents (22.8%) play or have played in the 1st league. The 4th league is represented by 23 respondents (16.9%). The 2nd league has 10 respondents (7.4%) and the 3rd league has the lowest number of respondents, 5 respondents (3.7%).

The answers received to the question on the respondents' opinion on the effectiveness of swimming as a means of recovery after exercise are shown in the following chart:

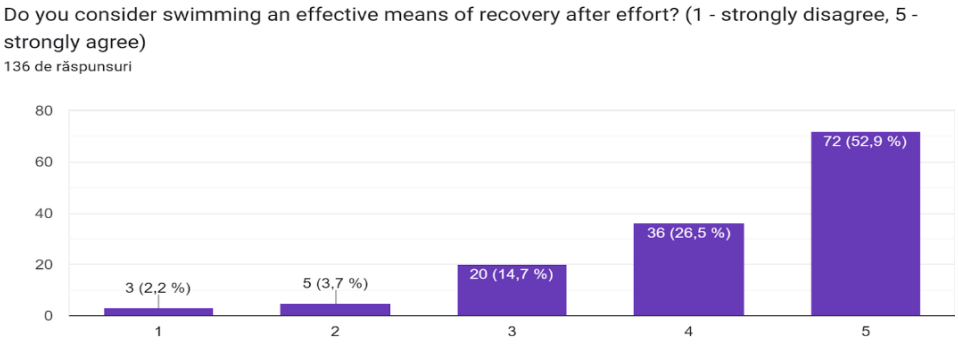

Chart 4. The effectiveness of swimming as a means of recovery after effort

The majority of respondents, 72 (52.9%) strongly agree (5 points awarded) that swimming is an effective means of recovery after effort; 36 respondents (26.5%) opted for a good agreement (4 points awarded); 20 respondents (14.7%) opted for a medium agreement (3 points awarded); 5 respondents (3.7%) opted for poor agreement; 3 respondents (2.2%) disagree with the question.

The answers received to the question on respondents' opinion on the effectiveness of swimming as a means of recovery after injuries are shown in the following chart:

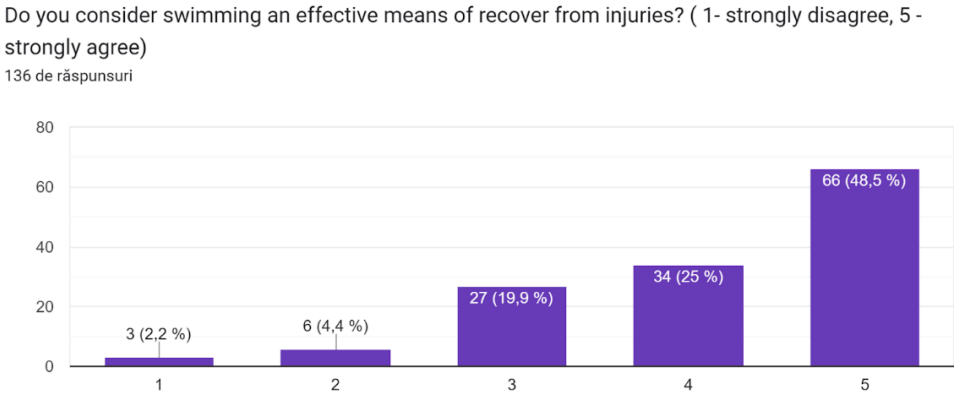

Chart 5. The effectiveness of swimming as a means of recovery after injuries

Most of the respondents, 66 (48.2%), strongly agree (5 points awarded) that swimming is an effective means of recovery after effort; 34 respondents (25%) opted for a good agreement (4 points awarded); 27 respondents (19.9%) opted for a medium agreement (3 points awarded); 6 respondents (4.4%) opted for poor agreement; 3 respondents (2.2%) disagree with the question.

The answers received to the question on the respondents' opinion on the effectiveness of swimming as a means of maintaining/improving general fitness are shown in the following chart:

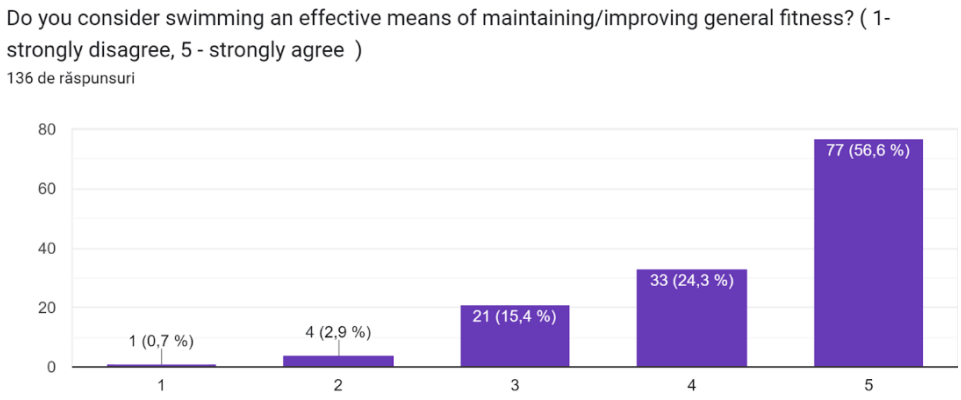

Chart 6. The effectiveness of swimming as a means of maintaining/improving general fitness

The majority of respondents, 77 (56.6%), strongly agree (5 points awarded) that swimming is an effective means of recovery after effort; 33 respondents (24.3%) opted for a good agreement (4 points awarded); 21 respondents (15.4%) opted for a medium agreement; 4 respondents (2.9%) opted for poor agreement; one respondent (0.7%) disagrees with the question.

The answers received to the question on the frequency of using swimming as a means of recovery after effort are shown in the chart:

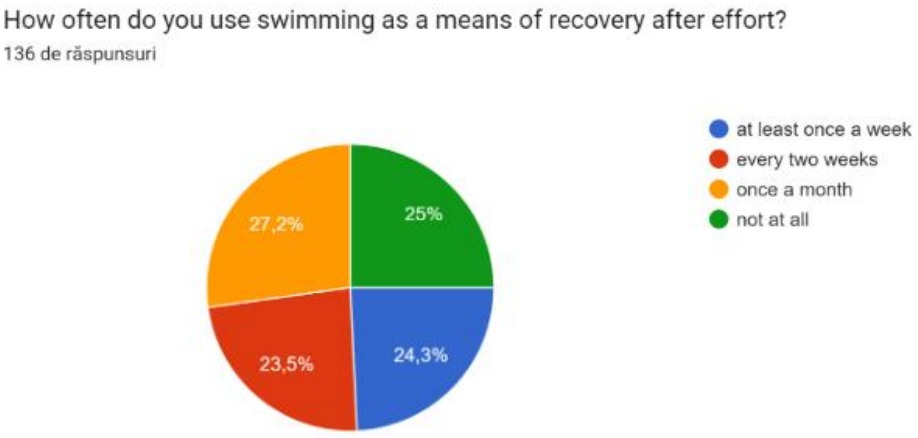

Chart 7. Frequency of using swimming as a means of recovery after effort

The answers received are relatively balanced, 33 of the respondents (24.3%) use swimming as a means of recovery after effort at least once a week; 32 of the respondents (23.5%) use it every two weeks; 37 of the respondents (27.2%) use it once a month; 34 of the respondents (25%) do not use swimming at all.

The answers received to the question on the frequency of using swimming as a means of recovery after injury are shown in the chart below:

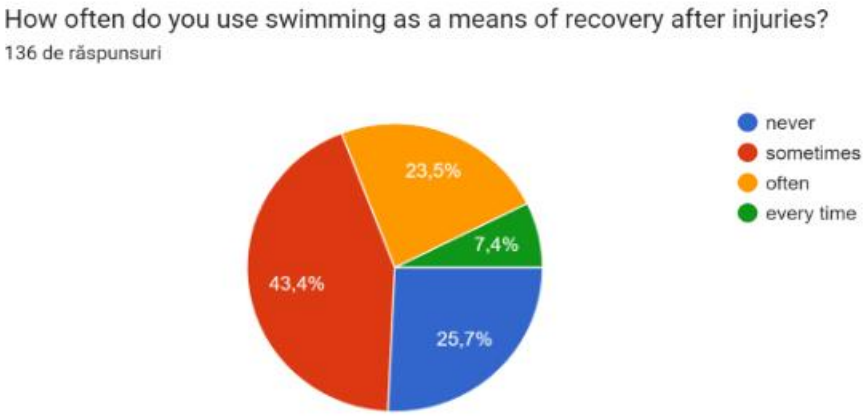

Chart 8. Frequency of using swimming as a means of recovery after effort

Most of the respondents, 59 (24.3%) sometimes use swimming as a means of recovery after injuries; 35 of the respondents (25.7%) never use it; 32 of the respondents (23.5%) often use it; 10 of the respondents (7.4%) always use swimming as a means of recovering from injuries.

The answers received to the question on the frequency of using swimming as a means of maintaining/improving general fitness are shown in the chart below:

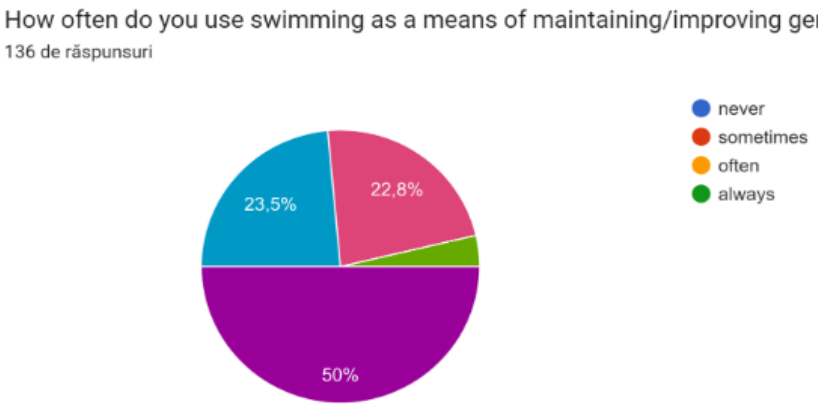

Chart 9. Frequency of using swimming as a means of maintaining/improving general fitness

Half of the respondents, 68 (50%), sometimes use swimming as a means of maintaining/improving general fitness; 32 of the respondents (23.5%) never use swimming as a means of maintaining/improving general fitness; 31 of the respondents (22.8%) often use swimming; 5 of the respondents (3.7%) always use swimming as a means of maintaining/improving general fitness.

The answers received to the question about the reasons why swimming is not used/ insufficiently used as a means of recovery after exercise/recovery after injuries/maintenance/improvement of general fitness are presented in the chart below. As this was a question for which more than one answer could be selected, the respondents have selected 184 answers.

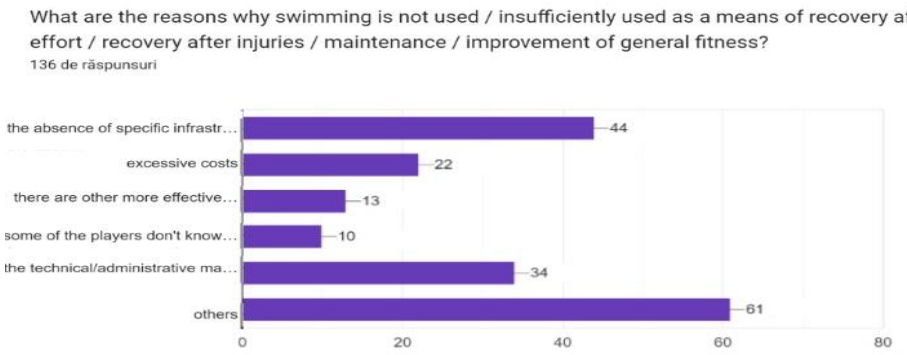

Chart 10. Reasons why swimming is not sufficiently used as a means of recovery after exercise, recovery from injury or maintenance/improvement of general fitness

The absence of specific infrastructure turns out to be the main reason why swimming is not sufficiently used as a means of recovery after effort, recovery after injuries or maintenance/improvement of general fitness by 44 of the respondents (23.9% of the total responses); 34 of the respondents (18.4% of the total responses) claimed that the technical and administrative management does not consider swimming necessary; 22 of the respondents (11.9% of the total responses) claimed that the costs are too high; 13 of the respondents (7% of the total responses) claimed that there are other more efficient means; 10 of the respondents (5.4% of the total responses) claimed that some of the football players do not know how to swim; 61 respondents (33.3% of the total responses) have indicated other reasons such as: risk of injury, risk of illness or lack of enjoyment when swimming.

5. Discussions

A study published in 2009 in the Journal of Strength and Conditioning Research compares recovery strategies used in young football players. The authors concluded that recovery sessions after effort should be considered as an integral part of training, taking into account several criteria such as: nature of the sport, body composition, recovery time, etc. The study shows the benefits of using aquatic activities as a means of recovery and pleads the implementation of combined recovery means.(Inugasa and Ilding 2009)

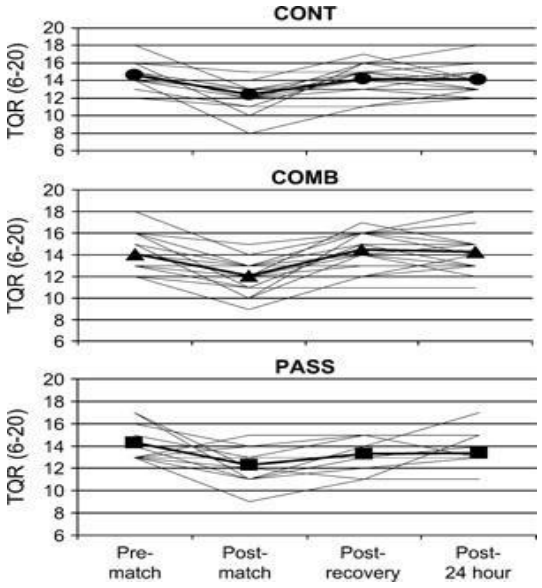

Figure 1. Total Quality of Recovery (TQR) values using different recovery strategies (Inugasa and Ilding 2009)

Another study published in 2014 in the Journal of Strength and Conditioning Research shows that recovering knee injury patients show reduced joint pain, improved balance and mobility after participating in a 6-week underwater treadmill recovery program that incorporated balance exercises and HIIT-type exercises. The authors also point out that no subjects experienced adverse reactions, suggesting that this type of recovery is well tolerated by patients.(Ressel et al. 2014)

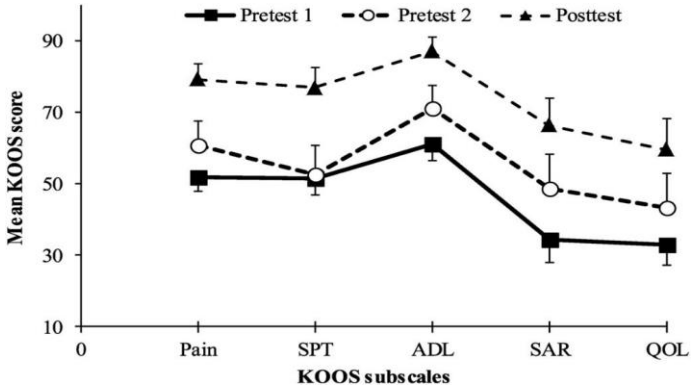

Figure 2. Knee Injury and Osteoarthritis Outcome Score (KOOS) subscale scores for baseline and endpoint testing (Ressel et al. 2014)

An article published on the website https://yoursoccerhome.com/, examines the advantages and disadvantages of swimming for football players. The advantages include: improved cardiovascular capacity, improved lung capacity, improved body stability, stabilized body mass index, improved flexibility, reduced recovery time after effort and reduced recovery time after injury. The article also points out the disadvantages of swimming: swimming is an aerobic exercise, whereas in football the action is fast and anaerobic. There is a risk of dehydration, swimming is not intense and is time consuming.

6. Conclusions

After conducting the study, we find that the majority of respondents consider swimming and water activity to be an effective means of body recovery after effort and injury. Regarding the effectiveness of swimming and water activity in maintaining/improving general fitness, the majority of respondents are in average agreement with this statement.

Although the majority of respondents are aware of the value of swimming and water activity for football players, only 51.4% of respondents use this means for body recovery after effort at least once a month.

Swimming and water activities were used by the majority of respondents as a means of recovery after injuries.

We also find that 48.6% of respondents do not use swimming and water activities at all as a means of maintaining/improving general fitness.

Thus, we find that swimming and water activities, although bringing many benefits as a means used by football players in recovery after effort, in recovery after injuries, in maintaining/improving general fitness, it is not used enough by the respondents. The main reasons why this means is not sufficiently used by the respondents are the lack of adequate infrastructure and excessive costs.

As a result of this survey, we suggest to coaches and physical trainers of football teams to include swimming and water activity in the training routine of the athletes. We suggest that swimming and water activity sessions be used as follows:

- Body recovery after effort: cold water immersion sessions, water immersion sessions with alternating cold/warm temperatures, warm water immersion sessions, slowly swimming, etc.;
- Recovery from injury: the use of swimming and water activities as prescribed by the doctor/physiotherapist;
- Maintaining/improving general fitness: the use of swimming sessions for active rest days.

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