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THE EFFECT OF AQUATIC TRAINING ON EXPLOSIVE STRENGTH AND THE ACCURACY OF THE SIDE THROW AND PENALTY KICK SKILLS IN YOUTH FOOTBALL PLAYERS

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Abstract
Chapter One includes the introduction and significance of the research. Sports training is considered the foundation for developing players toward optimal performance. Aquatic training, as a part of athletic training, has a high impact on player performance. Football, being a team sport, requires multifaceted training. Accordingly, the significance of this study emerges from implementing aquatic training due to observed deficiencies in explosive strength and certain skills among the players of the Al-Alam Sports Club. Through the researcher's observation of players during several competitions, it became clear that there is a need for such training to enhance player performance.
The aim of the research was to identify the effect of aquatic training on explosive strength and the accuracy of the side throw and penalty kick skills among youth football players. The hypothesis of the study was that aquatic training would have a statistically significant positive effect on these variables.
The researcher employed the experimental method using two groups (experimental and control). The research population consisted of players from Al-Alam Sports Club, totaling thirty players. The sample was divided into two groups of eleven players each. The most important conclusion drawn was that aquatic training had a positive effect on explosive strength and the accuracy of the side throw and penalty kick in the research sample. The researcher recommends applying this type of training in both team and individual sports and on different samples.

Keywords: Aquatic Training, Explosive Strength, Skill Accuracy, Youth Football Players, Penalty Kick and Side Throw.

Introduction

Research Introduction and Significance:

Sports training is one of the essential sciences that interrelates with other disciplines and directly impacts the athletic capabilities across different sports and activities, whether in

skill, physical, or tactical aspects. When training is scientifically and systematically planned, it inevitably yields elevated levels of success and excellence in competition.

Football is a sport that requires diverse and sequential training, with no aspect—however minor—neglected, whether it be the skill aspect, which reflects the player's talent and mastery of basic skills, or the physical aspect, which serves as the firm bridge connecting skill performance with tactical duties in an integrated process born from sound planning and a deep understanding of the training process.

Sports training represents the philosophy of the coach who is knowledgeable about training methods and tools that fulfill training requirements for football players. Aquatic training plays a role in increasing resistance and allows for greater joint range of motion due to the physical properties of water, especially buoyancy, which reduces joint pressure by lessening the player's effective weight. Moreover, water provides variable resistance in multiple directions, which has a significant impact on both the nervous and muscular systems.

Thus, the significance of this research lies in studying the effect of aquatic training on explosive strength and the accuracy of the side throw and penalty kick skills among youth football players.

Research Problem:

Football requires high physical effort due to its heavy reliance on physical and coordinative abilities. Performing complex skill elements under intense competitive conditions demands both compound skill execution and high-level physical output. This often leads players to advanced states of fatigue.

Through observing multiple matches of the *Al-Alam Sports Club* and based on field experience and review of relevant scientific sources and previous studies, the researcher identified a deficiency in training for explosive strength and in the accuracy of the side throw and penalty kick skills among youth football players.

With the increasing emphasis on safe training methods, aquatic training has emerged as a modern approach in sports science. It is used to develop physical abilities while minimizing stress on the musculoskeletal system, positively reflecting on the performance of basic football skills.

The research problem is therefore defined by the following question:

Does aquatic training impact explosive strength and accuracy inside throws and penalty kicks among youth football players?

Research Objectives:

The research aims to:

1. Design aquatic training programs for youth football players.
2. Identify the differences between the pre-test and post-test for the experimental group in explosive strength and the accuracy of the side throw and penalty kick.
3. Identify the differences between the post-tests of the experimental and control groups in explosive strength and the accuracy of the side throw and penalty kick.

Research Hypotheses:

The researcher hypothesizes:

1. There are statistically significant differences between the pre-test and post-test results for the experimental group in explosive strength and the accuracy of the side throw and penalty kick.
2. There are statistically significant differences between the post-test results of the experimental and control groups in explosive strength and the accuracy of the side throw and penalty kick.

Research Scope:

- **Location:** Salah al-Din Governorate / *Al-Alam Sports Club Stadium*
- **Participants:** Youth players from *Al-Alam Sports Club*
- **Time Limit:** From October 1, 2023, to December 25, 2023

Research Methodology and Field Procedures

Research Method:

The researcher employed the **experimental method** due to its suitability to nature and problem of the study.

Population and Sample of the Study:

The research population is the central focus and forms the core of the research problem; therefore, careful selection of an appropriate population is essential. The study population consisted of **youth football players from Al-Elm Sports Club**, totaling **thirty players**. The sample was selected randomly and consisted of **eleven players** for each group (experimental and controlled). Two injured players were excluded, along with six players who were involved in the pilot study. Thus, the sample size represented approximately **73%** of the total population, making it a valid and representative sample.

Instruments, Tools, and Equipment Used in the Study:

- Testing and Measurement
- References and sources
- Internet resources
- Questionnaire forms
- Four stopwatches
- Ten footballs
- Regulation-size football field

Field Procedures of the Study:

Selection of the Tests Used in the Study:

1. Side Throw Test[1]
   - Purpose: To measure the accuracy of the side throw.
2. Explosive Strength[2]

[1] **Zuhair Qasim Al-Khashab et al.** *Football* (2nd ed.), University of Mosul, Dar Al-Kutub for Printing and Publishing, 1999, p. 210.
[2] **Didier Reiss** (2013). *La Bible de la Préparation Physique*, Barcelona, Spain: Edition Amphora, p. 136.

- Test: Sargent vertical jump test (for both legs)

3. Penalty Kick Accuracy Test[3]
4. Seated Medicine Ball Throw Test[4]

- Purpose: To measure explosive arm strength

Pilot Experiment:

The pilot experiment is considered a preliminary step conducted by the researcher to select appropriate research methods. A sample of six players from Al-Alam Football Club was selected to identify both the positive and negative aspects necessary to complete the research requirements:

1. Identifying the suitability of the devices and tools for the research sample.
2. Ensuring the time required to conduct the tests to determine performance duration.
3. Assessing the capability of assisting the work team.
4. Regulating training schedules.

Pre-test:

The pre-tests for explosive strength (arms and legs), side throw accuracy, and penalty kick accuracy were conducted on Monday (October 2, 2023) at 4:00 PM at Al-Alam Club Stadium, using the research sample. The data were recorded in the information forms.

Implementation of Aquatic Environment Training:

Following the pre-tests, aquatic environment training was implemented from (October 16, 2023) to (November 20, 2023), over a period of six weeks, with two training sessions per week. Three exercises were administered per week with a gradual increase in intensity—from easy to difficult—to achieve the training goals.

Post-test:

The post-tests were conducted on Tuesday (November 21, 2023) to assess the impact of the training on the research sample. Afterward, the data were collected for statistical analysis and result extraction.

Statistical Methods:

The statistical program (SPSS) was used to obtain the results.

Presentation, Analysis, and Discussion of Results:

Presentation, Analysis, and Discussion of Pre-test and Post-test Results for Research Tests:

[3] **Raad Hussein Hamzah.** *The Effect of Special Exercises in Developing Specific Endurance and Its Relationship to Skill Performance in Football*, PhD Dissertation, College of Physical Education, University of Baghdad, 2003, p. 108.
[4] **Mohammed Abdel-Ghani Othman.** *Motor Learning and Sports Training*, Kuwait, Dar Al-Qalam for Publishing and Distribution, 1990, p. 136.

Table (1) Shows the means, standard deviations, and calculated T-values for the research sample tests of the control group.

Test	Pre-test Mean (M)	Pre-test Standard Deviation (SD)	Post-test Mean (M)	Post-test Standard Deviation (SD)	T-value (Calculated)	Statistical Significance
1. Explosive Strength (Arms) - Medicine Ball Throw from Sitting	3.43	0.85	4.12	0.87	3.52	Significant
2. Explosive Strength (Legs) - Sargent Jump Test	12.85	1.03	13.11	1.02	4.67	Significant
3. Side Throw Accuracy	5.27	0.90	7.85	0.95	3.34	Significant
4. Penalty Kick Accuracy	17.62	1.12	18.28	1.17	2.98	Significant

Significance Level (0.05), Degrees of Freedom (10), and Tabulated T-value (2.23)

Presentation, Analysis, and Discussion of Pre-test and Post-test Results for Research Tests:

Table (2) Shows the means, standard deviations, and calculated T-values for the research sample tests of the experimental group.

Test	Pre-test Mean (M)	Pre-test Standard Deviation (SD)	Post-test Mean (M)	Post-test Standard Deviation (SD)	T-value (Calculated)	Statistical Significance
1. Explosive Strength (Arms) - Medicine Ball Throw from Sitting	4.23	0.88	5.74	0.89	3.78	Significant
2. Explosive Strength (Legs) - Sargent Jump Test	13.70	1.15	22.12	1.34	4.93	Significant
3. Side Throw Accuracy	7.82	0.43	8.38	0.93	3.75	Significant
4. Penalty Kick Accuracy	17.92	0.98	20.23	1.24	3.28	Significant

Significance Level (0.05), Degrees of Freedom (10), and Tabulated T-value (2.23)

Presentation, Analysis, and Discussion of Pre-test and Post-test Results for Research Tests:

Table (3) Shows the means, standard deviations, and calculated T-values for the research sample tests of both the control and experimental groups.

Test	Control Group (Post-test) Mean (M)	Control Group (Post-test) Standard Deviation (SD)	Experimental Group (Post-test) Mean (M)	Experimental Group (Post-test) Standard Deviation (SD)	T-value (Calculated)	Statistical Significance
1. Explosive Strength (Arms) - Medicine Ball Throw from Sitting	4.12	0.87	5.74	0.89	3.87	Significant
2. Explosive Strength (Legs) - Sargent Jump Test	13.11	1.01	22.12	1.34	4.89	Significant
3. Side Throw Accuracy	7.85	0.95	8.38	1.35	3.72	Significant
4. Penalty Kick Accuracy	18.28	1.17	20.23	1.24	2.58	Significant

Significance Level (0.05), Degrees of Freedom (20), and Tabulated T-value (1.73)

Discussion of Results:

Based on the tables (1-2-3), it is evident that for the control group, the results showed random differences in explosive strength and the accuracy of the side throw and penalty kick between the pre-test and post-test. The researcher attributes this result to the fact that the training undergone by the control group was ineffective in enhancing the specific drills provided by the coach. Despite the improvements observed in the post-test, the type of training did not feature varied, multifaceted exercises, which would be necessary to reach the desired developmental goals for the investigated variables. The training focused on only one specific characteristic, which was not sufficient to reach the required level of development. This lack of variety in the drills led to this outcome, as the coach focused primarily on practice for the game rather than following the principles of readiness and comprehensive development in sports training. Effective sports training aims to prepare the body and improve the function of its parts and systems to operate in conditions that support higher physical readiness, which explains the results obtained .[5]

As for the results of the explosive strength tests, particularly the vertical jump test (Sargent Test), a significant improvement was found in the explosive strength of both the arms and legs between the pre-test and post-test in favor of the post-test for the experimental group. It was found that there was notable improvement in the players' performance, which was a result of consistent, regular, and varied training. This type of training reflected on increased

[5] Heya Faleh Khorsheed; "The Effect of Physical Skill Exercises on Interval Training Foundations for Various Physical, Skill, and Functional Variables in Young Football Players." PhD Thesis, College of Physical Education, University of Mosul, p. 51.

strength and body resistance in the water, indicating improved muscle groups during training. The training was characterized by controlled repetitions, and the training program was well-organized, considering the application of a movement path that matched the physical requirements[6]. The growth in physical and motor abilities is linked to the development of working muscles in athletes, because of the training, which prepares the effective training environment by utilizing various training environments and applying adaptation principles through the planned training (water environment). These exercises work to improve physical abilities using various exercises from different games and events, resulting in the development of physical abilities, especially explosive strength in both arms and legs. Thus, training in water and the variety of exercises through running, swimming, and resistance training have had a significant impact on the development of these abilities. Water training is considered an excellent and effective training method that improves muscular strength in different forms and enhances movement speed. This method forms the foundation for building all physical abilities and results in significant development. Therefore, the process of organizing training plays a vital role in improving performance, aligning with the players' potential to achieve positive results. Organizational principles are significant in sports training, which is why training during field practice must align with the development of technical skills and the improvement of physical traits[7].

Additionally, the skill-related variables in football, such as the side throw, are no less important than other skills. It was found that there were statistically significant differences for the research sample. The researcher believes that the contribution of water training to the side throw skill was significant, as it achieved the research goal of developing players in this skill. The side throw is an essential skill for introducing the ball into play, and it should be practiced correctly. If not executed properly, it can pose a risk, as the ball may not reach the player in the best position to build an attack[8].

The researcher also attributes the significant differences observed in the relationship between certain muscle strength and pass accuracy to the lack of focus on linking physical exercises with essential skills for young players. It is crucial to focus on the physical variables required to develop basic skills. To achieve a good height in jumps, for example, it is necessary to first learn the correct technique for jumping and be fully prepared physically for it, particularly focusing on motor abilities directly associated with the force exertion needed for jumping. Therefore, preparing general strength and training specific strength has significant meaning in football training[9].

Conclusions:

1. The water-based training implemented by the experimental group resulted in positive development in all the variables under study.

[6] Mohammed Ali Al-Qat; "The Functions of Sports Training Members: An Applied Approach," 1st Edition, Cairo, Dar Al-Fikr Al-Arabi, 1999, p. 36.
[7] Qasim Hassan Hussein and Nizar Al-Talib Majid; "Theoretical and Mechanical Foundations in Training for the Decathlon for Men and Heptathlon for Women," Mosul, Directorate of Dar Al-Kutub for Printing and Publishing, 1987, p. 24.
[8] Hudhayfah Najm Khazal; "Football Lectures," Basra, 2023, p. 58.
[9] Kazem Abdul-Rubaei and Abdullah Al-Mashhadani; "Football for Youth," Dar Al-Hikma Printing Press, University of Basra, 1991, p. 151.

2. The research sample showed enthusiasm and interest in performing water-based training during the training sessions.
3. The experimental group players, who performed water-based training, outperformed the control group players in all the variables under study.

Recommendations:

1. It is essential to apply water-based training based on correct scientific principles to develop the physical abilities and basic skills of football players.
2. Coaches should ensure that training durations are as close as possible to the actual match time.
3. Similar research and studies can be conducted on other team sports and for different age groups.
4. Similar research and studies can also be conducted on female futsal players.