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Research Paper

Some Physical and Respiratory Variables and Their Relationship to The Accuracy of The Spike in Volleyball

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ABSTRACT	Manuscript Info.
<p>Correct assessment of the physical and respiratory variables associated with the performance of the spike can lead to improving players' training and developing performance strategies. The study can also contribute to achieving progress in the field of measuring and analyzing sports performance and its practical applications, Therefore, studying the relationship between physical and psychological variables has a major role in understanding whether there is a direct relationship between physical and respiratory variables and the accuracy of the spike in volleyball.</p> <p>The descriptive approach was used using the correlational method to suit the nature of the research procedures. The study sample included 16 university volleyball team players, selected from the research community of 20 players. After the tests were conducted and the data was collected, it was processed statistically to reach the most important conclusions, which were built based on the results achieved from the research, the most important of which are:</p> <ol style="list-style-type: none"> 1. Increasing the vital efficiency of the respiratory system has a major role in increasing the accuracy of performance in the spike skill to increase neuromuscular health. 2. There is a positive relationship between respiratory variables and the accuracy of the spike skill in volleyball in the research sample. 	<ul style="list-style-type: none"> ✓ ISSN No: 2584-184X ✓ Received: 09-08-2024 ✓ Accepted: 13-10-2024 ✓ Published: 26-10-2024 ✓ MRR:2(10):2024;43-47 ✓ ©2024, All Rights Reserved. ✓ Peer Review Process: Yes ✓ Plagiarism Checked: Yes
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KEYWORDS: Physical, respiratory, and accuracy.

1. INTRODUCTION

Scientific research in the field of volleyball is of great importance and comprehensive analyses are the key to understanding the complex relationships between different factors and their impact on players' performance. In this study, we will detail the principles of impact, breathing and various physical factors that affect the spike. The different stages of the and their relationship with the individual's physical and respiratory strength will be analyzed. Advanced scientific tools and techniques will be used to identify the influencing

factors and qualities that improve players' performance and development in this.

The main and primary goal of this study is to provide a comprehensive, detailed and accurate analysis of the complex and joint relationship between physical and respiratory factors and the effects that occur on the accuracy of the spike in volleyball. The importance of this analysis lies in the great ability to identify the influencing factors that play a positive or negative role in the performance of professional and amateur players in this exciting sport full of diverse and multiple

challenges. Based on the results that have been reached and examined accurately and comprehensively, it will be possible to provide specific and codified scientific and practical recommendations to improve the overall performance of teams and develop the level of training and qualification effectively. This comprehensive and useful study, which is considered one of the most important specialized studies in the field of modern sports and volleyball in particular, will contribute significantly and effectively to the development of scientific knowledge and a comprehensive understanding of this vital and important field in a remarkable and comprehensive manner. It will also contribute to the development of methods and techniques used in this field, and provide the necessary scientific guidelines and standards for training and physical and respiratory rehabilitation for beginners and professionals alike. Moreover, this study will have a significant impact in raising the level of awareness and sports culture among coaches, sports doctors, players and those interested in this field.¹

Therefore, it can be said that this comprehensive study will greatly enhance the scientific and technical capabilities of individuals and teams specialized in volleyball, and contribute to the development and progress of this interesting sport and its acquisition of more attention and fame. Breathing is one of the vital factors during exercise, as the body's need for oxygen increases during sports activity, which requires the respiratory system to increase the volume and frequency of breathing. The function of the respiratory system is to provide the oxygen necessary for metabolic procedures in the muscles during physical activity.² Gas exchange in the respiratory system is represented in receiving oxygen from the air and transporting it to the blood, in addition to getting rid of carbon dioxide produced by metabolism and returning it to the air. The importance of this study stems from the need for coaches and those interested in volleyball to understand the factors that affect the accuracy of the spike. Correct assessment of the physical and respiratory variables associated with the performance of the spike can lead to improving players' training and developing performance strategies. The study can also contribute to achieving progress in the field of measuring and analyzing sports performance and its practical applications.

Research Problem

The research problem lies in searching for the nature of the relationship between physical and respiratory variables and the spike in volleyball. This comes in order to stand on the most important variables that have a major role in achieving advanced sports results, especially in volleyball, as the researcher noticed that there is a difference in the performance of players from one half to another and from one match to another, and this difference in performance affects the results of the game and the levels of players.

Therefore, studying the relationship between physical and psychological variables has a major role in understanding whether there is a direct relationship between physical and respiratory variables and the accuracy of the spike in volleyball.

2. RESEARCH OBJECTIVES

To identify the relationship between physical and respiratory variables and the accuracy of the volleyball spike.

Research hypotheses

There is a statistically significant relationship between physical and respiratory variables and the accuracy of the volleyball spike.

Research field

Human field: Kirkuk University volleyball team players for the academic year 2023-2024.

Time field: From 02-11-2023 to 02-01-2024.

Spatial field: Sports hall in the College of Physical Education and Sports Sciences / Kirkuk University.

3. RESEARCH METHODOLOGY

The descriptive approach with correlational relationships was used because it is suitable for the nature of the research procedures.

Research community and sample

The research community included volleyball players for the academic year 2023-2024, which numbered 20 players. 18 players were chosen from them to represent the sample to represent the community after 4 players were excluded to conduct the exploratory experiment. Also, homogeneity was conducted for the sample members in the variables of height, age and weight, as shown in Table (1).

Table 1: Shows the homogeneity of the sample

		Age	Length	Weight
N	Valid	16	16	16
	Missing	0	0	0
Mean		20.88	179.313	79.063
Median		21	180	81
Std. Deviation		0.81	3.401	5.08
Skewness		0.25	0.364	0.48
Std. Error of Skewness		0.564	0.564	0.56

From table (1) I note from Table 1 that the value of the skewness coefficient is between ± 1 , which indicates that the research sample is homogeneous.

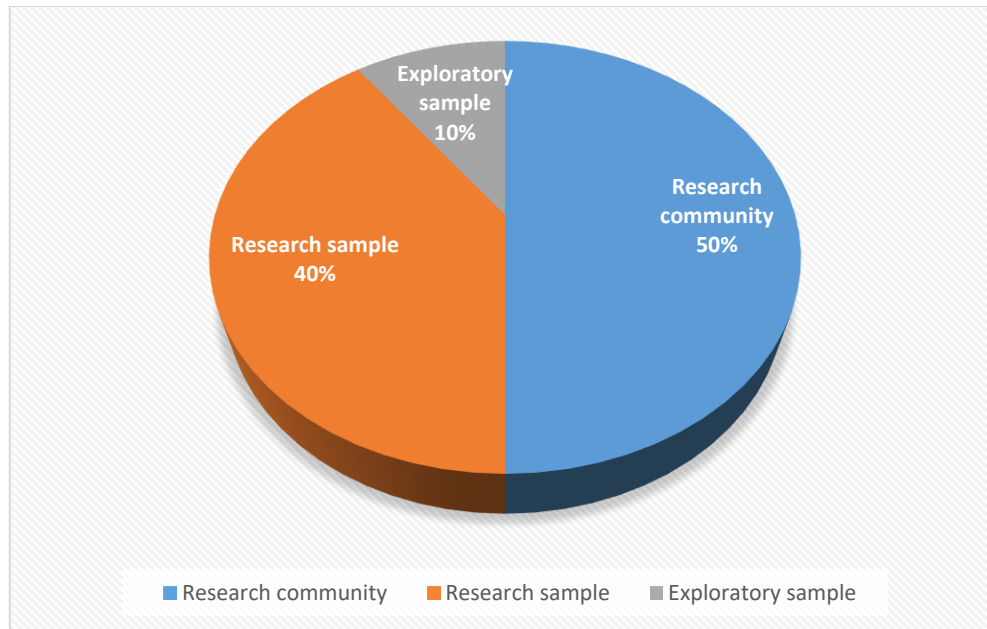


Figure 1.: Shows the distribution of the research sample about the research community.

Devices and tools used in the research

- 12 volleyballs.
- Volleyball court.
- Legal volleyball net.
- Tapes of different colors.
- Electronic stopwatch.
- Anthropometric tape measure.
- Legal whistle.
- Chalk.

Exploratory experiment

The exploratory experiment was conducted on 11/4/2023 on a small sample of the research community, which numbered 4 players, in order to control variables that might hinder the work of the main sample in the tests, to control the time required for the test, and to familiarize the research sample with the nature of the tests and how to implement them.

Main experiment

Tests used in the research

1. Sargent's standing vertical jump test³

- **Purpose of the test:** Measure the speed-characteristic strength of the upper limb.
- **Equipment used:** Volleyball court, legal volleyballs and a legal whistle with an anthropometric measuring tape and chalk.
- **Test description:** Jumping from a standing position and determining the difference between two points, the first fixed from rest and the second from jumping.
- **Scoring method:** The difference between the two points representing the player's ability to jump the farthest possible distance is calculated.

- **Measurement unit:** Centimeter and its parts.

2. Sit-up test 60 seconds⁴

- **Purpose of the test:** Measure strength endurance.
- **Tools used:** Electronic stopwatch, 1 cm high compressed sponge mat and whistle.
- **Test description:** From the lying position, the tester sits up and repeats the performance for 60 seconds and for the largest possible number of times.
- **Recording method:** The number of repetitions is calculated during lying and sitting within the specified period of the test.
- **Unit of measurement:** Number.

3. Ten-second sprint test⁵

- **Purpose of the test:** To measure transitional speed.
- **Equipment:** Stopwatch, level path with a starting line at the beginning.
- **Performance specifications:** The tester stands behind the starting line and from a high starting position, and upon hearing the start signal, he runs for ten seconds, ending upon hearing a signal from the referee.
- **Recording:** The distance that the tester was able to run in the specified time is calculated.

4. Respiratory System Tests⁶

- **Purpose of the test:** Measure the vital capacity of the lung.
- **Tools used:** Anthropometric tape and electronic stopwatch.

- **Test description:** From a sitting position on a chair in a resting position, the number of breaths is measured within 60 seconds.
- **Recording method:** The number of breaths is calculated using a stopwatch and within 60 seconds,

then the vital capacity is calculated using the following equation:

$$VC (male) = (27.63 - 0.112 * Age) * Length$$

4. RESULTS AND DISCUSSIONS

Table 2: Show Descriptive Statistics for article variables

Variables	Mean	Std. Deviation	N
Transition speed	71.75	7.308	16
Endurance strength	48.25	4.33	16
Strength with power speed	89.063	7.75	16
Number of breaths	13.3125	.79320	16
Respiratory vital capacity	4449.2138	99.12893	16
Accuracy	19.07	1.182	16

Table 3: Shows the relationship between physical variables and the accuracy of the volleyball spike

Variables and Correlations		Transition speed	Endurance strength	Strength with power speed	Number of breaths	Respiratory vital capacity
Accuracy	Pearson Correlation	0.824	0.89	0.73	0.94	0.91
	Sig. (2-tailed)	0.02	0.001	0.07	0.01	0.03
	N	16	16	16	16	16

It has been shown that there is a strong and very significant positive relationship between the variables under study and the accuracy of the spike in volleyball. Advanced scientific findings indicate that players with a very high level of muscle strength, endurance and speed show much greater accuracy and unparalleled stability in executing their spikes. In addition, the current study has identified a significant positive effect of increasing lung capacity and respiratory capacity on high physical performance when executing spikes, in terms of their accuracy and amazing power.⁷

Improving physical and respiratory variables has a very significant impact on the accuracy of the spike in a way that cannot be ignored. This is because the increase in physical abilities such as muscle strength, speed and endurance contribute greatly to the development and improvement of the physical and respiratory performance of players. Consequently, this improvement is reflected in their spike skills, as they become more able to increase the speed of the spike and improve its accuracy and coordination of movement. Therefore, it is clear that improving physical and respiratory variables has a very significant impact on the accuracy of the spike and contributes directly to improving the performance of players on the field.⁸

Therefore, working on developing these variables is essential to obtain positive results at the sports level. In addition, it is also important to provide athletes with appropriate guidance and training to enhance these vital variables. This can be achieved by developing intensive and comprehensive training programs that target the development of the physical and respiratory aspects of athletes, which helps them achieve optimal performance in the spike.⁹

Consequently, you will notice an increase in the strength of the spike, its stability, smooth movement and better results in the game. Furthermore, proper nutrition and a healthy diet should

also be taken care of to enhance physical performance and improve fitness. By consuming foods rich in protein and nutrients, muscle growth can be improved and the metabolic rate can be increased, which leads to an improvement in overall spike performance. Finally, athletes should be allocated regular time for rest and relaxation, as this helps rehabilitate the body, replenish energy and strengthen mental strength. In sum, it can be said that working on improving physical and respiratory variables is a crucial factor in achieving significant progress in spike and raising the level of sports play.¹⁰

Therefore, the importance of enhancing muscle strength for volleyball players and improving respiratory function cannot be underestimated, as this can have a huge and real impact on the performance of these players in executing their spikes with accuracy and power. In light of these findings, achieving better performance in training and competition certainly requires specialized exercises designed to enhance strength, accuracy and improve respiratory function. It is worth noting that attention to muscle strength and lung capacity is not limited to physical training only, but also to taking care of the aspects of nutrition, body rest and good sleep. Providing appropriate health and environmental factors can contribute to improving muscle flexibility and increasing the respiratory system's ability to withstand physical stress.

5. CONCLUSIONS

1. Increasing the vital efficiency of the respiratory system has a major role in increasing the accuracy of performance in the spike skill to increase neuromuscular health.
2. There is a positive relationship between respiratory variables and the accuracy of the spike skill in volleyball in the research sample.

3. There is a positive relationship between the physical variables under study and the accuracy of the spike skill in volleyball in the research sample.
4. The results also showed a strong correlation between respiratory variables and physical variables, which has a major role in increasing the accuracy of the spike skill in volleyball.

6. Recommendations

1. The necessity of implementing a program to improve the variables of physical and respiratory capabilities of volleyball players with the aim of improving the accuracy of the spike.
2. It is necessary for practical applications to include resistance and endurance training to improve physical fitness and respiratory efficiency.
3. The necessity of including breathing training to enhance breathing control and improve pulmonary airflow.

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