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MEASUREMENTS OF THE CARDIAC MUSCLE AND THEIR RELATIONSHIP TO SOME SKILLFUL PERFORMANCE REQUIREMENTS IN VOLLEYBALL FOR YOUNG PLAYERS

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Abstract

The study included an introduction and the significance of research in the use of measurements of cardiac muscle and its impact on the requirements of performance and effectiveness, so the teachers' ideas tended toward the process of enhancing the level, as it became a concern for all those involved in the field of training in all their specialties and that access to the sports championship or maintaining the level. The study included an introduction and the significance of research in the use of measurements of cardiac muscle and its impact on the requirements of performance and effectiveness, so the teachers' ideas tended toward the process of enhancing the level, as it became a concern for all those involved in the field of training in all their specialties and that access to the sports championship or maintaining the level. In addition, these results can be relied upon as a result of the advancement of scientific research and as a means of resolving issues associated with determining or halting the athletic level; hence, the significance of research involving the use of modern technical instruments to examine the heart muscle and its measurements. The problem of the research was used a form of a question: Do the measurements of the cardiac muscle have correlations with the skill performance requirements of

volleyball? As for the research objectives, it was to know the effect of some cardiac muscle measurements for young volleyball players and to identify the skill performance requirements of young volleyball players, as well as to know the relationship between the cardiac muscle measurements under study and the skill performance requirements of young volleyball players. As for the research's hypotheses, they involve the existence of a statistically significant association between cardiac measures and the needs of volleyball skill performance. As for the research's hypotheses, they involve the existence of a statistically significant association between cardiac measures and the needs of volleyball skill performance. The most important conclusions reached by the researcher are the improvement of the functional level of the sample and the development of measurements of the cardiac muscle in the sample. Regarding the recommendations, the most essential ones were the necessity of validating the planned training objectives during tests and measurements, as well as the value of functional and cardiac measurements.

Keyword: Cardiac, Muscle, Skillful, Performance, Volleyball.

Introduction

The game of volleyball is one of the sports that has a prominent position among other sports in terms of spread and popularity in different parts of the world (Ismailova, 2022). Through research and tests, those with expertise and an interest in the subject have attempted to identify the most effective scientific tools and techniques for enhancing the allure and enjoyment of this game (Rosseland-Harrison, 2022). It enhances its level of performance by working to increase the effectiveness of its players and different age groups in every respect (physical, skillful, tactical, psychological, educational, etc.) (Rahmonovich, 2022). Skillful performance in volleyball is seen as a vital factor in changing and achieving results, and these situations are regarded as one of the most effective offensive methods for achieving excellent and distinguishing results (Musa et al., 2022). If they are well exploited in matches due to their effect of emphasising the advantage of focus and accuracy that one, two, or three players on most teams possess, and if the outcome of the match depends on the ability of the executing player to score points in order for the team he plays for to win, then it is likely that these strategies will become more prevalent (Hanna, 2022). The process of improving the level has become a concern for all those involved in the field of training, regardless of their area of expertise, and reaching the sports tournament or maintaining the level requires arduous and exceptional efforts from the coaches and

players, as well as the resolution of all scientific issues that impede the team's advancement (Gil-Arias et al., 2021). And only by the application of science, new technologies, and the scientific method through scientific study that these crises of intense competition among athletes can be resolved and the level raised (Amin Al Ashqar, 2019). It depended on a variety of aspects, including the application of scientific principles to the science of sports training, such as physiology, biochemistry, tests, and measurements (Schleitzer et al., 2022). These outcomes can also be relied upon as a result of the advancement of scientific study and as a means of resolving issues associated with determining or halting the athletic level (Chunmei, 2021). As a result, the researcher examined one of the modern technical devices for examining cardiac muscle and its measurements using an ultrasound device, as well as its relationship with the requirements of skillful performance, which is one of the fundamental pillars of providing a high level of collective and individual performance for a team.

Research Problem:

The problem can be formulated with the following question:

The first question: Do measurements of the cardiac muscle have correlations with the requirements of skillful performance in volleyball?

Research Objectives:

1. Identifying some measurements of the cardiac muscle of young volleyball players.
2. Identifying the skill performance requirements of youth volleyball players.
3. Identifying the relationship between the measurements of the cardiac muscle under study and the skill performance requirements of young volleyball players.

Research hypotheses:

1- There is a statistically significant relationship between cardiac measurements and the skillful performance requirements of volleyball.

Research fields:

Human field: 12 young volleyball players

Time field: 3/3/2021 to 25/6/2021

Spatial field: Martyr Wissam Oreibi Hall, Hospital of Heart Center in Misan.

Methodology

Research Methodology:

The researcher utilised the descriptive method due to its applicability for resolving the research problem, since the descriptive method is the study of phenomena and

occurrences, the collecting of data, and the analysis of growth (Thompson Burdine Thorne & Sandhu, 2021) .

The Research Community:

The researcher identified her research community in the Missan Oil Club, who numbered (14) players for the sports season (2020-2021), who are registered in the lists of the sub-union in Misan. While the research sample is the model on which the research is conducted, the researcher must choose her research sample so that it is representative of the original community in a real representation, moreover, it must be possible to generalise the results of this sample to the original population from which it was drawn (Lehdonvirta et al., 2021), and the researcher chose the research community as a whole, with the exception of some players, i.e. the research sample was (12) players, with a percentage of (85%)

The researcher also homogenized the sample in variables (height, weight, age, training age, heart rate, blood pressure, systolic and diastolic).

Table 1: It shows the homogeneity of the sample in terms of (weight - height - age - training age).

Variables	M	SD	Coefficient of variation
Height	186.50	1.88	2.10
Weight	87.80	81 .1	1.74
Chronological age	18.58	0.32	2.23
Training age	5.67	0.42	0.21

The means of collecting information:

1. Arabic and foreign sources
2. The Internet
3. Tests and measurements
4. Assistant Work Team Right Appendix No. (2)

The devices and tools used:

1. Vivid E9 Doppler Ultrasound Scanner.
2. Electronic blood pressure monitor (Beurer)
3. Whistle number (3) fox type.
4. Volleyballs (20) legal.
5. Plastic signs, number (35)
6. Stopwatch number (4)
7. Metric tape measure.

8. Sony camera.
9. Scale for measuring weight (nova)
10. Calculator type (Kenko)
11. Indoor volleyball hall

Determination of myocardial measurements and functional indicators:

For the purpose of determining measurements of the cardiac muscle and functional indicators of rest and physical effort, a questionnaire form was designed (3) and the researcher surveyed the opinions of a group of experts and specialists in the fields of (tests and measurement, sports training, physiology, chest and cardio) and as shown in Appendix (1) and after collecting The questionnaires showed the percentage of agreement on measurements of the heart muscle and functional indicators through the percentage law, and the researcher relied on (75%) in the required measurements (Appendix (1), as shown in Table (2).

Table 2: Shows the percentage of expert agreement in myocardial measurements and suggested functional indicators

No	Physical Traits	Repetition	Percentage
1	Left ventricle diameter	19	%100
2	Right ventricle diameter	17	%89.4
3	Left atrium diameter	19	%100
4	Right atrium diameter	19	%100
5	Diameter of the aortic trunk	19	%100
6	The volume of blood pushed in one stroke	19	%100
7	Cardiac output	18	%94.7
8	Heart rate	19	%100
9	Arterial pressure	17	%89.4
10	Breathing rate	18	%94.7

Tests used in the research:

Measurements of the cardiac muscle:

The device used: - Echo (sound ultrasound examination device)

device specifications:

Device name: - Mohranalnstrument - Vivid E9
Year of manufacture: - 2012
Company name: Nhopaha
Device type and use: - cardiac diagnostic tester
The device's working voltage: - 220 volts

Test method: The tester stands on the treadmill after connecting the poles associated with the device, then starts operating the treadmill according to the time period and the angle of inclination suggested and programmed according to the treadmill, then after the end of the physical effort and the player's descent directly, he undergoes the test by echocardiography, which the specialist doctor (*) extracts The required variables, and at the same time, blood is drawn (5 cc) by the specialized medical assistant (*), and then the blood pressure is measured by the medical assistant, and the heart rate is measured through the echocardiogram, while the breathing rate is done by one of the team Assisted work by observing the athlete's breathing mechanics.
skill tests

First: performance speed test (Lidor & Ziv, 2010).
Test name: Skill performance speed
The purpose of the test: - Measuring the speed of skillful performance of the young in volleyball
Second - Performance Endurance Test (Papanikolaou et al., 2019).
The name of the test: Measuring skillful performance with a running test (5 x 30 meters back and forth with the ball).
The purpose of the test: - Measuring the endurance performance of the volleyball ball
The main experiment
The researcher applied the tests in the main experiment on the research sample during two days 5-6/3/2020, as on the first day and at exactly four o'clock in the afternoon, measurements and examinations were conducted on the cardiac muscle in the heart hospital and by a specialist(*)
On the second, in Martyr Wissam Oreibi Hall, at four o'clock, heart rate, blood pressure, and respiration were measured from sitting, and then as a result of the performance endurance test, sufficient rest was given, and then a performance speed test was performed.

Statistical means The researcher used the statistical program (SPSS) and extracted the results of the study.
1. Arithmetic mean
2. Standard Deviation
3. Simple correlation law (Pearson)
4. Relative coefficient of variation for unrelated samples

Presentation and discussion of the results:
Presentation and discussion of the results of measurements of the cardiac muscle and the test of endurance and speed of performance in volleyball:

Table 3: The arithmetic mean and standard deviations show the measurements of the cardiac muscle, endurance and speed performance of volleyball

No	Tests	Experimental group	
		M	SD
1	Systolic pressure	120.83	2.43
2	Diastolic pressure	77.83	4.78
3	Heart rate	65.33	15.85
4	Breathing rate	25.83	18.24
5	Aortic trunk	2.33	0.13
6	Left atrium diameter	2.77	0.02
7	Left ventricle diameter	5.21	0.03
8	Right ventricle diameter	2.11	0.05
9	Blood flow speed	17.08	0.54
10	Blood volume pushed in one stroke	73.33	2.52
11	Cardiac output	3.97	0.19
12	Performance bearing	10.83	0.73
13	Performance speed	25.07	1.26

Table No. (3) shows that the cardiac measurements and the functions of the circulatory system all indicate values higher than the normal values and indicate the level of development and improvement of the research sample in a relative manner, and the results of the speed endurance and performance tests also indicate an improvement in the level of the sample in an average manner. The researcher believes that the reason for this is due to the approach followed by the training staff and the nature of the exercises used, in addition to the organized and continuous training, which lasts 6 days and a time of 3 hours for the training unit, and this was known through inquiry from the team coach. The researcher also attributes that the participation in the experimental and test matches and the competitions that the team is involved in also had an impact on the changes in the measurements of the cardiac muscle, endurance and speed of performance. As mentioned Essa (2020), training induces functional changes in the body's systems, such as the heart and blood circulation. Individuals with adequate training are able to adjust to the functional changes that occur in the body's systems as a result of the muscular effort method. While Trajkovi et al. (2020) affirmed, one of the changes that occur in the heart as a result of organised sports training is the decrease in the number of heart beats during rest or during physical effort, as well as the heart's return to its normal state after physical effort.

Presentation and discussion of the results of the correlations between measurements of the cardiac muscle and the test of endurance and speed of performance in volleyball:

Table 4: Shows the correlation matrix between measurements of the cardiac muscle endurance and speed performance

No	**Measurements**	**Performance Bearing**	**Performance Speed**
1	Systolic pressure	0.36	0.58
2	diastolic pressure	0.47	0.58
3	heart rate	*0.62	**0.76-
4	breathing rate	*0.54	**0.87-
5	Aortic trunk	*0.66-	**0.88
6	left atrium diameter	0.22	0.33
7	Left ventricle diameter	*0.59-	**0.61
8	Right ventricle diameter	0.55-	0.45
9	blood flow speed	**0.66-	*0.56
10	blood volume paid in one stroke	**0.65-	**0.79
11	cardiac output	*0.65-	**0.79

The value of (P) at 10 degrees of freed and the significance level (0.1) and (0.05) are (0.70) and (0.57)

It is clear from Table (4) that there is a significant correlation between the measurements of the heart muscle and the endurance and speed of performance in all measurements except (systolic and diastolic pressure, the diameter of the left atrium and the diameter of the right ventricle). The researcher believes that the standard changes of the cardiac muscle, which have a significant impact on the increase in the functional efficiency of the heart muscle and the circulatory system in the delivery of oxygenated blood through an increase in the volume of blood paid and the force of contraction of the heart and the rise in cardiac output and the accompanying decrease in heart rate and respiratory rate is evidence of economy in the work of the muscle And it must have a major role in the continuation of the energy production that the individual athlete needs during the performance of the competitions, and this provides the sufficient amount of energy and the disposal of metabolic waste to produce energy in addition to the speed of oxygen compensation for the deficit and the oxygen debt and the increase in the maximum consumption of oxygen, which of course depends on the muscle The heart, circulatory system and respiratory system, which the results of the research indicate to be improved, and thus showed this correlation in improving

the performance of endurance and speed of performance. According to Getahun (2022), the success of training programmes is determined by the progress made by the individual athlete in the type of sport, and this depends on the individual's adaptability to the training programme that he applies. Tesfaye and Hundito (2022) indicate that the heart becomes more efficient, and is able to pump blood and increase its flow to the working muscles, confirming that this increases their supply of energy and oxygen, which indicates the functional efficiency of the heart due to the regular effort that occurs to it, as the adaptation that results from regular training programmes causes functional changes in the heart, represented by the expansion of the heart cavities.

Conclusions

The most important findings of the researcher are as follows:

1. Improving the functional level of the research sample.
2. The development of cardiac muscle measurements in the research sample.
3. A relatively high level of endurance and speed of performance.
4. The presence of a significant effect in the increase in functional efficiency and measurements of the cardiac muscle on improving the level of endurance and speed of performance, which caused a significant correlation in most of the cardiac measurements and the functional variables under study.

Recommendations:

The most important recommendations of the researcher are as follows:

1. The importance of verifying the desired aims of the training process through tests and measurements.
2. The need to emphasize functional measurements and cardiac measurements that clearly reflect the safety and efficiency of functional devices and the role of the training process in achieving this.
3. Emphasis on conducting other functional measurements in the respiratory circulatory system and on other skills and physical attributes

References

1. Al Behadili, H. J. H., & Kasim, M. A. (2022). Effects Of A Training Program For The Plyometric On The Harmonic Abilities And Muscular Ability Of Football Players. *European Journal of Interdisciplinary Research and Development*, *6*, 60-69.
2. Ali, H. F. S., & Kasim, M. A. (2022). The Effect Of An Educational Curriculum Using The Jigsaw Strategy To Learning Skills Of Volleyball For Secondary School Students. *European Journal of Interdisciplinary Research and Development*, *9*, 160-168.

3. Amin Al Ashqar, M. (2019). Psychological Steadfastness and its relationship with The Competition Anxiety and Motivation of the Sports Achievement For Volleyball players seating. *The International Scientific Journal of Physical Education and Sport Sciences*, *7*(1), 83-94.
4. Chunmei, C. (2021). Research Progress on Selection Methods of Volleyball Players. *J Adv Sport Phys Edu*, *4*(8), 172-175.
5. Essa, M. M. (2020). The effect of using supplementing on some physiological variables and slowing the appearance of fatigue in volleyball players. *Journal of Applied Sports Science*, *10*(1), 27-37.
6. Getahun, B. (2022). *Effects of Circuit Training on Selected Physical Fitness Qualities and Technical Skills of Youth Volleyball Players* (Doctoral dissertation).
7. Gil-Arias, A., Diloy-Peña, S., Sevil-Serrano, J., García-González, L., & Abós, Á. (2021). A hybrid tgfu/se volleyball teaching unit for enhancing motivation in physical education: A mixed-method approach. *International Journal of Environmental Research and Public Health*, *18*(1), 110.
8. Hanna, S. J. (2022). The Effect of Corrective Exercises According to some Biomechanical Variables to Develop the skill of Spiking in Volleyball for Female Players Al-Amanah Sports Club. *Revista iberoamericana de psicología del ejercicio y el deporte*, *17*(4), 191-197.
9. Ismailova, A. (2022). Volleyball is a popular game in many countries around the world. *ACADEMICIA: An International Multidisciplinary Research Journal*, *12*(10), 75-85.
10. Kasim, M. A. (2022). Evaluation Implementing Cooperative Learning In Physical Education College Programs To Basic Handball Skills Learning In Universities Iraqi. *ResearchJet Journal of Analysis and Inventions*, *3*(04), 289-297.
11. Lehdonvirta, V., Oksanen, A., Räsänen, P., & Blank, G. (2021). Social media, web, and panel surveys: using non-probability samples in social and policy research. *Policy & internet*, *13*(1), 134-155.
12. Lidor, R., & Ziv, G. (2010). Physical and physiological attributes of female volleyball players-a review. *The Journal of Strength & Conditioning Research*, *24*(7), 1963-1973.
13. Musa, R. M., Suppiah, P. K., Abdullah, M. R., Majeed, A. P. A., & Razmaan, M. A. M. (2022). Positional differences in the performance of volleyball players for anthropometric and psychological readiness in a congested fixture tournament. *Journal of Physical Education & Sport*, *22*(4).
14. Papanikolaou, K., Chatzinikolaou, A., Pontidis, T., Avloniti, A., Deli, C. K., Leontsini, D., ... & Fatouros, I. G. (2019). The Yo-Yo intermittent endurance level 2 test: reliability of performance scores, physiological responses and overload characteristics in competitive soccer, basketball and volleyball players. *Journal of human kinetics*, *67*(1), 223-233.

15. Rahmonovich, H. M. (2022). Planning general and special physical training of young volleyball players during training. *ACADEMICIA: An International Multidisciplinary Research Journal*, *12*(8), 82-86.
16. Rosseland-Harrison, F. (2022). Volleyball, but Make it Sexy: Mediated Representations of Female Athletes.
17. Schleitzer, S., Wirtz, S., Julian, R., & Eils, E. (2022). Development and evaluation of an inertial measurement unit (IMU) system for jump detection and jump height estimation in beach volleyball. *German Journal of Exercise and Sport Research*, *52*(2), 228-236.
18. Tesfaye, E., & Hundito, B. (2022). The effect of physical fitness training on the performance of youth volleyball project players: the case of ana Lemo woreda, Hadiya zone, Ethiopia. *Journal of Social Sciences and Management Studies*, *1*(1), 32-40.
19. Thompson Burdine, J., Thorne, S., & Sandhu, G. (2021). Interpretive description: a flexible qualitative methodology for medical education research. *Medical Education*, *55*(3), 336-343.
20. Trajković, N., Pajek, M., Sporiš, G., Petrinović, L., & Bogataj, Š. (2020). Reducing aggression and improving physical fitness in adolescents through an after-school volleyball program. *Frontiers in psychology*, *11*, 2081.