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THE EFFECT OF USING ANAEROBIC ENERGY SYSTEMS TO KNOW THE OUTCOME OF FATIGUE INDEX IN SOME SPORTS FOR FEMALE STUDENTS

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Abstract

The study aimed to:

To identify the extent of the effect of using anaerobic effort on the amount of fatigue index among female handball, basketball and volleyball players in the College of Physical Education and Sports Sciences, University of Basra.

For this reason, the researcher chose the research sample in a deliberate way, and they are some students of the University of Basra in handball, basketball and volleyball for the academic year (2021-2022), and their number is (30) players. (10) players for each game, as for the proportion of the research sample, they respectively constituted (62.5, 83.33, 83.33%) of the original community and for the purpose of ensuring the homogeneity of the sample in the variables that may affect the course of the experiment in front of the researcher, the researcher performed the statistical equation using the coefficient of variation It appeared that all values of the coefficient of variation were less than (30%),and then statistical transactions were performed After processing the data with a computer according to the statistical program 21SPSS Ver, a set of conclusions were reached, the most important of which are:

1- There is a difference in the fatigue index of the first energy system between the female handball, basketball and volleyball players in the stage and in favor of the female handball players.

The most important recommendations are:

1- Emphasis on warming up during practical lessons, especially in games that need a quick start

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Keywords: aerobic system, anaerobic system, first energy system, second power system.

1 - Introduction and importance of the research:

There is no longer any room for doubt that access to optimal sports performance in various sports activities depends on the employment of science and the use of its various and modern methods in revealing the requirements of this activity and the capabilities of its practitioners. Basically, which depends mainly on energy production systems, including the anaerobic energy system on which many games and various sports activities depend. The body's organs and the reactions of physical exercises on the physiological and chemical aspects that change according to the nature of the physical activity being practiced, which calls for identifying the various responses to benefit from them and to identify the level of physical fitness of the individual. Sports activity leads to physiological and chemical changes within the muscle cell to produce the energy needed for physical effort as a result of the increase in the activity of hormones that participate in the metabolism process.

Codified training programs, which are implemented in an orderly manner, bring about regular rapid developments in the functional, physical and skill efficiency of the athlete and reach the goals of the training process (Dhurgham and others ,2022) That it is necessary to practice sports activity and standardized sports programs in order to elevate the individual athlete[1] . For the purpose of developing training programs for various sports events, the coach must rely on the principle of privacy in training first, that is, privacy according to the working energy system. Ie determines the power system controlling in that process. Modern sports training depends on focusing its objectives on the development of energy production systems and the accompanying functional changes. Whenever the aerobic and anaerobic ability of the athlete improves, this is directly reflected on the level of physical and skill performance [2] .

The production of energy in the human body is one of the important topics in the field of sports physiology because it is one of the topics closely related to human life and the efficiency of the body during physical performance in the sports field. In order to preserve the amount of energy during the game, because the games require a great effort during the game [3]. The importance of energy for the human body appears in that it makes it perform all its complex vital functions during physical activity, and the importance of the research lies in

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knowing the relationship between the use of anaerobic energy systems and the output of the fatigue index for some Sports games among the female students of the College of Physical Education and Sports Sciences at the University of Basra to find out the facts and information that help the teachers in planning and changing the warm-up to achieve the goals that were set for them because of the importance of this functional ability in achieving achievement, and this was confirmed by (Dhurgham and others, 2022) That it is necessary to motivate students to perform sports and try to ration energy expenditures to perform the course without showing signs of fatigue [4], and from here the research problem came in the form of a question: Is there a difference in the effect of using anaerobic energy systems to know the outcome of the fatigue index between players of handball, basketball and volleyball in the College of Physical Education and Sports Sciences, University of Basra?

2- Objective of the research:

To identify the extent of the effect of using anaerobic effort on the amount of fatigue index among female handball, basketball and volleyball players in the College of Physical Education and Sports Sciences, University of Basra.

3 Research methodology and field procedures

3-1 Research Methodology

The researchers used the descriptive approach in the comparative study style for its suitability and the method of the study.

2-3 research sample

The goals that the researcher sets for his research and the procedures he uses will determine the nature of the sample that you will choose [5], for this reason, the researcher chose the research sample in a deliberate way, and they are some students of the University of Basra in handball, basketball and volleyball for the academic year (2021-2022), and their number is (30) players. (10) players for each game, as for the proportion of the research sample, they respectively constituted (62.5, 83.33, 83.33%) of the original community and for the purpose of ensuring the homogeneity of the sample in the variables that may affect the course of the experiment in front of the researcher, the researcher performed the statistical equation using the coefficient of variation It appeared that all values of the coefficient of variation were less than (30%) [6], which indicates

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the homogeneity of the research sample in the variables, The arithmetic mean and standard deviation were, respectively Long (Mean ,175,170,173)cm , standard deviation -/+(2.15 , 3.10 , 2.20)cm , Miss (Mean ,65,70,68)Kg, standard deviation -/+(3 , 2.50 , 1.14)Kg , Age (Mean ,21,22,21)Year, standard deviation -/+(1, 2 , 2)Year ,

3 – 3 Means of collecting information, devices and tools used

3-3-1 Means of collecting information:

The researcher used the following methods and tools to collect information

Arab and foreign sources.

Tests and measurements used in research.

3-3-2 Tools used:.

The researcher used the following methods and tools to collect information

- Arab and foreign sources.
- Tests and measurements used in research.
- Electronic stopwatch.
- Handball court.
- Square and field track.
- measuring tapes
- whistle

3-4 tests used:

3-4-1 Anaerobic stress test (Rest) [7]

To measure the ability (Rest), the anaerobic test was used, and then the fatigue index was identified. It is a test in which preparations begin by measuring the weight of the body. Then (6) quick runs are made for a distance of (60) meters and a rest period is given between one repetition and another for a period of (10) seconds, and the time is recorded Each repetition to the nearest hundredth of a second in order to calculate the anaerobic capacity for each repetition, as follows:

Distance 2 ÷ Time 3 x Weight

The anaerobic capacity for the six repetitions is calculated separately, then the following are determined:

The highest power (watts), which is the highest value recorded

The minimum power (watts), which is the lowest value - recorded

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The average anaerobic capacity, measured in watts, is the sum of the values divided by the number of repetitions.

As for the fatigue index, it is extracted by (watts/second), which is the product of subtracting the highest anaerobic capacity from the lowest anaerobic capacity, all divided by the total time of the six repetitions.

3-4-2 Anaerobic stress test (Rest) [8]

To measure the ability (Rest) the anaerobic test was used and then to identify the fatigue index, a test in which preparations begin by measuring the weight of the body, then (6) quick runs for a distance of (35) meters are given and a rest period is given between one repetition and another for a period of (10) seconds, and the time is recorded Each repetition to the nearest hundredth of a second in order to calculate the anaerobic capacity for each repetition, as follows:

Distance 2 ÷ Time 3 x Weight

The anaerobic capacity for the six repetitions is calculated separately, then the following is determined:

The highest power (watts), which is the highest value recorded

Minimum power (watts), which is the lowest value - recorded

The average anaerobic power is measured in watts, which is the sum of the values divided by the number of repetitions

As for the fatigue index, it is extracted by (watts/second), which is the product of subtracting the highest anaerobic capacity from the lowest anaerobic capacity, divided all by the total time of the six repetitions.

3-5 exploratory experience.

The exploratory experiment was conducted on 01/03/2022 AD on (3) students from the third stage in the College of Physical Education and Sports Sciences - University of Basra, and the practical procedures that will be applied in the main research experiment were implemented, and the purpose of this experiment was to identify Performing the tests and the adequate period of time for the main experiment as well as ensuring the correct timings for each iteration.

3-6 Main research experience

The main experiment was conducted on the research sample on (17/03/2022) at (10) in the morning and in the closed hall in the College of Physical Education and Sports Sciences - University of Basra.

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3-7 Statistical means

The researcher used the statistical bag (21spss ver.) to obtain the following data:
1/ Arithmetic mean.
2/ Standard deviation.
3/ Percentage [9]

4- Presentation, analysis and discussion of the results

4.1 Presentation, analysis and discussion of the results of the fatigue index test among the research sample

This section included a presentation of the research results indicated by the results of the tests that the researcher relied on in his research, and they were presented in the form of tables, through which we can interpret the statistical numerical values to indicate the validity of these results or not and the extent to which they achieve the research hypotheses and objectives. It eliminates the potential for error in the later stages of research and strengthens the scientific evidence and gives it strength [10]. Analyzing information means extracting quantitative and qualitative scientific evidence and indicators that prove the answer to questions and confirm whether or not its hypotheses are accepted] [11.

Table (1): It shows the arithmetic means and standard deviations of the fatigue index of the two energy systems in the research sample

No	variable(fatigue index)	measuring unit	handball players		basketball players		volleyball players	
			Mean	Std	Mean	Std	Mean	Std
1	first energy system	watts/sec	11.831	3.371	7.500	3.007	8.404	1.425
2	second power system		6.976	0.982	2.339	1.168	2.491	0.837

Through the above table, the research sample used the first energy system, and it was found that the arithmetic mean value of the fatigue index for handball players was (11.831), while the standard deviation was (3.371). The standard deviation was (3.007), while the arithmetic mean value of the volleyball players fatigue index was (8.404), while the standard deviation was (1.425).

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Through the above table, the research sample used the second energy system, as it was found that the arithmetic mean value of the fatigue index for female handball players was (6.976), while the standard deviation was (0.982), while the arithmetic mean value of the fatigue index among basketball players was (2,339), while the standard deviation was (1.168), while the arithmetic mean value of the fatigue index for female volleyball players was (2.491), while the standard deviation was (0.837).

Table (2):The analysis of variance shows the fatigue index variable of the two energy systems in the research sample

No	variable	Contrast sources	sum of squares	df	mean squares	F	Sig
1	First energy system	between groups	104.389	2	52.194	6.976	.004
		inside the groups	202.011	27	7.482		
		the total	306.400	29			
2	second power system	between groups	138.800	2	69.400	68.695	.000
		inside the groups	27.277	27	1.010		
		the total	166.078	29			

Table (2) shows the results of the arithmetic means and the standard deviations of the fatigue index of the first and second energy systems in the research sample, where it became clear that there are apparent differences between some arithmetic means in the fatigue index of the research sample, and for the purpose of testing the hypothesis related to the significance of the differences for the fatigue index of the two energy systems were treated statistically by The analysis of variance (F), which is shown in Table (2), and the test of the least significant difference (L.S.D), as the analysis of variance works to find out whether these differences are due to a real difference between these cases and not due to the circumstance of application or chance [12] Based on the foregoing, the results of these two variables were presented and discussed as follows:

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Table (3):It shows the means and the (L.S.D) value of the fatigue index variable for the two energy systems of the research sample

No	fatigue index	the game	Groups	media teams	Sig
1	First energy system	handball	Basketball	* 4.331	.001
			volleyball	* 3.427	.009
		Basketball	handball	-* 4.331	.001
			volleyball	- 0.904	.466
		volleyball	handball	- * 3.427	.009
			Basketball	0.904	.466
2	second power system	handball	Basketball	* 4.637	.000
			volleyball	* 4.485	.000
		Basketball	handball	-* 4.637	.000
			volleyball	- 0.152	.738
		volleyball	handball	-* 4.485	.000
			Basketball	0.152	.738

It was found in Table (2) that the value of (F) calculated for the fatigue index in the first energy system for the research sample is greater than the value of (F) tabular, and this means that there are significant differences, so the least significant difference (L.S.D) was used, which put the results of its operations in Table (3) It was clear that there is a difference between the female handball, basketball and volleyball players, and this means that the fatigue index using the first energy system for the female basketball and volleyball players was less than that of the female handball players.

We find that there is a difference between handball players and basketball players, and between handball and volleyball players, and in favor of handball players. Which leads to rapid fatigue and slow player performance and a decrease in his abilities[13] . Therefore, there was a difference in the fatigue

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index between the research sample due to the fact that the handball players were practicing fast running during the practical lessons with high repetitions, which led to cutting the distance in a short time, in addition to the fact that the number of practical materials that take in the second stage is more than the rest of the stages, which makes The student does many repetitions, and therefore the physical fitness is better than the third and fourth stages, and the recovery period was short between the six repetitions to cover a distance of (35) meters, which is (10) seconds, which requires the presence of a special prolongation consisting of the length of the speed and the length of the force to maintain and for the longest possible period At the level of the enemy, therefore, Talha Hussam El-Din indicates that there must be a large force in order to produce a known change in velocity and in a specific time proportional to the mass of the body, and that it is easy to notice that the greater the rate of change in the velocity of a body with a known mass, that means an increase in thrust, and the relationship of force with thrust That the force is sufficient to bring about the required change in speed, it cannot be available unless the appropriate time is given to it, especially in the stage of follow-up to the movement of the tool [14].

It was shown through Table (2) that the value of (F) calculated for the fatigue index in the second energy system for the research sample is greater than the value of (F) tabular, and this means that there are significant differences, so the least significant difference (L.S.D) was used, which put the results of its operations in Table (3) It was found that there is a difference between the players of handball, basketball and volleyball, and this means that the fatigue index using the second energy system for basketball and volleyball players was greater than that of handball players. The researcher attributes the reason for this to the element of speed that handball players have compared to basketball players and volleyball players, which led to cutting a distance (60 meters) in less time than basketball and volleyball players, so the higher the speed, the shorter the time period. This is because the mass of the body has a great role because it is considered one of the two sides of the equation and affecting the result of the fatigue index, in addition to the fact that the larger the mass, the greater the force needed to overcome its inertia of inertia. A thrust that enables him to increase his speed, trying through these steps to change his position and the amount of his speed by overcoming his inertia [15], and Talha Hussam El Din and Ali Muhammad Abdel Rahman indicated to him in Newton's first law (the law of

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inertia) that every body remains in its state of rest Or the uniform motion in a straight line unless it is acted upon by external forces that change its state [16].

Conclusions:

Based on the results of the research and the statistical analysis of the data and its discussion, the researcher reached the following conclusions:

1- There is a difference in the fatigue index of the first energy system between the female handball, basketball and volleyball players in the stage and in favor of the female handball players.

2- There is a difference in the fatigue index of the second energy system between the female handball, basketball and volleyball players in the stage and in favor of the female handball players.

Recommendations:

In the light of the results, the study recommended the following:

1- Emphasis on warming up during practical lessons, especially in games that need a quick start.

2 - Giving enough time during the scientific lessons to perform exercises and quick starts with multiple repetitions.

3 - The need to pay attention to the physical aspect and fitness, especially for females, because of their health benefits, as they are more likely to gain weight, especially third and fourth stage students.

4- The necessity of conducting a study on a larger sample to follow the changes of fatigue and using other stresses.

5- The necessity of conducting other studies on other functional organs in the body, especially for females.

The References

1. Hasan, A. J., Hussein, G. L., Abdullah, M. H., & Al-Jadaan, D. A. N. (2022). THE IMPACT OF THE COGNITIVE APPRENTICESHIP STRATEGY IN LEARNING SOME TECHNICAL GEMS'SKILLS FOR STUDENTS. ResearchJet Journal of Analysis and Inventions, 3(04), 145-159.
2. Muhammad Maree Ali Muhammad(2004): The effect of interval training using different times of the first effort area on some physical and skill variables and pulse rate. PhD thesis, College of Physical Education, University of Mosul, pp. 10-12

3. Neamah, D. A., & Mustafa, U. S. (2018). TEST PROROSAL TO EVALUATE SPECIFIC ENDURANCE AND THE AMOUNT MOTION FOR HANDBALL PLAYERS. ACADEMIA E STUDII ECONOMICE DIN BUCURESTI Departmentul de Educatie Fizica si Sport, 22, 56-66.
4. Hussein, G. L., Hasan, A. J., Fadel, M. H., & Al-Jadaan, D. A. N. (2022). THE EFFECT OF BABY'S STRATEGY ON LEARNING SOME SKILLS IN THE ARTISTIC GYMNASTICS OF THE CUBS. ResearchJet Journal of Analysis and Inventions, 3(04), 160-171.
5. Al-Jadaan, D. A. N., Zaalan, M. S., & Ali, I. A. (2020). Analytical Study to Indicate the Comparison in Biomechanical Variables of Handball Scoring. International Journal of Psychosocial Rehabilitation, 24(02).
6. Al-Jadaan, A. N. (2021). AN ANALYTICAL STUDY OF THE LEVELS OF PSYCHOLOGICAL COMPATIBILITY IN PREMIER-CLASS HANDBALL PLAYERS. Turkish Journal of Physiotherapy and Rehabilitation, 32(3).
7. Al-Dabbagh, Ahmed Abdel-Ghani and others(2006): The effect of accumulating anaerobic effort on some blood and some variables, research published in the Journal of the College of Basic Education, Volume 3, Issue 3. P. 304
8. Al-Dabbagh, Ahmed Abdel-Ghani and others(2006): The effect of accumulating anaerobic effort on some blood and some variables, research published in the Journal of the College of Basic Education, Volume 3, Issue 3. P. 306
9. Al-Jadaan, D. A. N., Zaalan, M. S., & Ali, I. A. (2020). Analytical Study to Indicate the Comparison in Biomechanical Variables of Handball Scoring. International Journal of Psychosocial Rehabilitation, DOI: 10.37200/IJPR/V24I2/PR200327, 24(02).p(224-2230)
10. Aljadaan, D. A. S. N. (2018). The amount of movement quantity decrease and its effect on the output accuracy and strength to the skill of remote aiming by jumping for handball. Bucharest, marathon journal, 10(2), 67.
11. Saleh Hamad Al-Assaf(1995); Introduction to research in behavioral sciences: Riyadh, Obeikan Library, p. 11.
12. Dhurgham Abdul Salam Neamah Aljadaan and others (2022) . Designing and Codifying A Test to Measure The Accuracy of Performing The Scoring Skill by Jumping Forward and Some Biomechanical Variables after Performing Physical Effort in the Handball, JournalNX - A Multidisciplinary Peer Reviewed Journal, doi.org/10.17605/OSF.IO/TXKFG ,VOLUME 8, ISSUE 5 , p 35-42

ResearchJet Journal of Analysis and Inventions
https://reserchjet.academiascience.org

13. Dhurgham A. Neamah Al-Jadaan& others (2021) . An analytical study of the levels of psychological compatibility in premier-class handball players , Turkish Journal of Physiotherapy and Rehabilitation, 32(3) , p 47
14. Talha Hussam El Din and others(1998): Applied Kinesiology. Part 1,edit 1, Cairo, Book Center for Publishing, , p. 201.
15. Dhurgham A. Neamah Al-Jadaan& others (2020) . An analytical study for some variables index of biomechanical aiming skill for corner handball players , International Journal of Psychosocial Rehabilitation, DOI: 10.37200/IJPR/V24I2/PR200328 , 24(2), p(231-240)
16. Dhurgham A. Neamah Al-Jadaan , Imad Adel Ali (2020) . Design and rationing of a test to measure the accuracy of the cornering skill by jumping from a corner and some biomechanical variables after performing the physical effort with a handball , International Journal of Psychosocial Rehabilitation , DOI: 10.37200/IJPR/V24I1/PR290487 , 24(9),P.(4541-4548)
17. Motasim Mahmoud Shatnawi and others (2021) : Analytical study of some biomechanical variables for the accuracy of the performance of the correction skill by jumping forward with a hand ball, Turkish Journal of Physiotherapy and Rehabilitation, Vol 32 , Issu 3 , p 2859.
18. Hasan, L. M., Noori, A. B., & Oda, M. J.(2022).The Influence of the Rofini Model on Learning Some Basic and Sensory Perceptions in the Game of Female Tennis, Journal of Studies and Researches of Sport Education(JSRSE), DOI: https://doi.org/10.55998/jsrse.v32i1.285, 32(1),p.16-27.