

# THE RELATIONSHIP OF SOME PHYSIOLOGICAL INDICATORS TO DETERMINING THE LEVEL OF SKILL PERFORMANCE OF BASKETBALL PLAYERS

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## Abstract:

The research aims to identify the relationship of some physiological indicators to determining the level of skill performance of basketball players by identifying the differences between groups of physiological indicators and performance effectiveness of the research sample and identifying the relationship between some physiological indicators and performance effectiveness of the research sample.

The researchers used tests and measurements of physiological indicators and an individual observation form to evaluate the effectiveness of each player's performance. For the statistical aspect, the researchers used the arithmetic mean and standard deviation. Percentage. Analysis of variance (F). Simple correlation (Pearson)

The researchers concluded that there is a significant correlation between long anaerobic capacity and heart rate with the performance effectiveness of the research sample teams. Likewise, there was no significant correlation between short anaerobic capacity (phosphagenia) and aerobic capacity with the performance effectiveness of the research sample teams.

The researchers recommended the necessity of developing the elements of physical fitness, especially speed, speed endurance, and general endurance, during training curricula because of their close connection to blood pressure, heart rate, and the recovery process, while ensuring regularity in training. Emphasis is placed on opening development and training courses for basketball coaches with the assistance of game experts from developed countries in the field of basketball, especially in the field of physiology, to clarify the importance of functional indicators during training and competitions. .

**Keywords:** Physiological indicators - skill performance level - basketball.

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## The introduction:

In our modern era, the science of sports training physiology is considered a basic basis for all sports training processes, the results of which have emerged in the form of continuous development that we observe in the level of physical, skill and tactical performance as a result of the physiological effects of the training load on the various body systems, through which the individual acquires adaptation processes for the body's vital systems to face... Fatigue and effort resulting from training and competitions.

Progress at the athletic level is nothing but functional and biological adaptations that occur in the internal systems, and accordingly, the individual's functional capabilities increase, which vary in

degree of influence according to the nature of each activity, the time of practice, and the style of performance. . (Abu Al-Ela Abdel Fattah , 2008, p. 22)

Therefore, progress in the game of basketball requires continuous practical experiments on physical, skill, tactical, functional, psychological and educational abilities in order to apply them on the field in accordance with the style of the game, its rules and laws, as standardized sports training “has a significant impact in raising blood circulation activity in nerve and muscle cells and the speed of oxygen transfer.

Basketball is one of the activities that requires many scientific efforts to find the means and methods that help basketball players perform during the match according to a scientific method based on observation and experimentation. Knowing the player’s performance during the match is one of the important and necessary matters to reflect some aspects of the effectiveness of the methods and training methods used, each of which has an impact in improving the players’ performance as a result of some adaptations to the functional equipment. (Muhammad Abdel Rahim, 2003, p. 125)

By knowing the effectiveness of a player’s performance by analyzing and evaluating his skills and movements during the match, we can avoid errors associated with performance and enhance the correct movements of successful skills.

One of the basic requirements for training work is to conduct performance analysis and evaluation to diagnose and treat errors that occur as a result of various playing conditions and the complexities accompanying performance that appear during competitions. Although there are means and methods for measuring skills and physical, tactical, and psychological capabilities outside the scope of match time, this information that is obtained from... These measurements did not give the true picture of the player’s level as he performed those skills on the field and during the match, due to the presence of factors that affect his level of performance. (Bob Cousey, 1997 p98)

### **1- Research problem :**

Not long ago, developed countries in the field of sports began to subject sports training processes to medical examinations, tests and physiological measurements in order to improve the functioning of the vital systems of basketball players, which reveals the level of adaptation enjoyed by these systems and the extent of the relationship between the functional state of the body and physical capabilities, which may affect On the player's performance during the course of the match.

Through the researcher’s follow-up of the Algerian Premier Basketball League and his experience as a former player, as well as polling the opinions of experts and specialists, he noticed that there is a decrease in the effectiveness of performance during the course of the match, especially in the third and fourth quarters, The gradual decline begins due to the decline in the level of the players’ physical abilities, which negatively affects the effectiveness of the performance, which affects the results of the matches. This is the reason for the problem that the researcher addressed, which is the decline in the level and failure to achieve full adaptation of the functional devices, which is consistent with the specificity of the basketball game and which is reflected by some physiological indicators, such as Pulse rate, blood pressure, pulse pressure, aerobic and anaerobic capabilities, through which the positions, skills and movements that the player acts during the match are evaluated.

### **2- research aims :**

1- Identifying the differences between groups regarding physiological indicators and performance effectiveness of the research sample.

2- Identifying the relationship between some physiological indicators and the effectiveness of performance of the research sample.

- research assumes :

1- There are differences between groups regarding functional indicators and performance effectiveness for the research sample.

2- There is a significant correlation between some physiological indicators and the effectiveness of performance of the research sample.

### **3- research importance :**

It focuses on the extent of the relationship between functional indicators represented by anaerobic capacity and aerobic capacity of both types, as well as studying some functional variables during rest and effort, which will be adopted as research indicators, including (heart rate, arterial blood pressure, pulse pressure, average arterial pressure) and the effectiveness of the performance of basketball players.

In order to develop and plan training curricula in light of the results of the research, which helps direct the processes of preparing players according to the scientific method.

### **4- Research areas:**

1- Human field: 25 players from Division One basketball clubs 2022-2023.

2- Spatial field: closed sports halls for the clubs of the selected research sample.

3- Time range: 07/12/2022 – 20/05/2023.

### **5- Search terms:**

- Physiological indicators:

- Skill performance level:

- basketball:

- **Systolic blood pressure:**

Arterial blood pressure during the myocardial contraction phase of the cardiac cycle and occurs when the manometer index is in the range of 120-140 mm/Hg.

- **Diastolic blood pressure:**

Arterial blood pressure during the myocardial relaxation phase of the cardiac cycle, which falls in the range of 60-90 mm/Hg.

The wave caused by blood forced into an artery, the effect of heart contraction and the expansion occurring in the arterial bush, calculated from the difference between systolic pressure and diastolic pressure, which in a normal state reaches 40 mm/Hg.

**Anaerobic capacity:**

“It is the ability or efficiency of the muscle to produce anaerobic energy, which the player uses to perform the strong and fast movements required by the playing conditions.

- **Aerobic capacity:**

“It is the maximum amount of oxygen that the body can consume during a given unit of time.

- **Physiological characteristics of basketball:**

Basketball players differ from other players in other sports in terms of physical development (height or need for oxygen) (Abdel Rahman Zaher, 2011)

The heart of a basketball player has a functional capacity to absorb blood at a rate of 1060 milliliters. As for the other systems and organs, their capacity and function do not differ compared to the systems and organs of players of other teams. A basketball player needs 12.6 calories of energy per minute, and even in basketball this is taken into account. According to curricula and preparation methods, according to classification, grades, age, awareness of playing, and level of

fitness. During training and the match, the player's pulse rate reaches (175-180 n/d), the systolic blood pressure rises (180-200 mmHg) and diastolic (60-90 mm/Hg), and the need for oxygen reaches about 3000 milliliters per minute, or 40.4 milliliters per minute. One kg of the player's weight and the oxygen demand reaches 6.8 litres.

Abu Al-Ala Abdel Fattah points out that the number of breathing times during play is more than 50-85 breathing cycles per minute, and the heart rate is more than 200 V/d depending on the speed of play and the activity of the player, but the heart rate during the match should reach 170-190 V/d. Stopping play for 20-60 seconds also leads to a decrease in the heart rate by 100-140 n/min. Based on the results of (Kariman), the volume of the basketball player's heart reaches (1201 cm<sup>3</sup>), and the volume of blood expelled per minute reaches when performing work of high intensity. (24 liters) per minute, and the volume of one batch is 167 milliliters. . (Abu Al-Ela Abdel , 2008, p. 22)

**- Performance level:**

These are the movements, skills, and situations that can be performed on the field during the match, and they may be with or without the ball, and they are done using technical methods. Therefore, they take the character of simple movements, and perhaps complex movements in composition, and their performance takes into account the playing conditions and the performance of the opposing team. Therefore, it requires the player to be aware of the expected and unexpected situations of play and analyze them during the match. The course of the match and the use of smart solutions when performing. In most cases, "the player lacks the automatic feature when playing against the opponent or in the match" (Moayed Abdullah Jassim, 1999)

Therefore, the player must take the appropriate decision in playing and act correctly in different playing situations, so that the coach can realize the suitability of the training plan in proportion to their physical, skill and tactical abilities.

**6- Research methodology and field procedures:**

**6.1- Research Methodology :**

The researcher used the descriptive method using the survey method as it is the best method to achieve the objectives of this research, as it is a method that depends on studying reality or the phenomenon as it exists in reality, and is interested in describing it accurately and expressing it qualitatively or quantitatively.

**6.2- The research sample :**

The research sample was chosen intentionally from players from some of the 16 clubs in the first division of Algerian basketball, where only five clubs were selected, constituting 31%, The five main players who represent clubs for the 2022-2023 season were selected, as the number of members of the research sample reached 25 players out of 200 players, as this number constituted 12% of the original population of the research and they represent clubs (Blida, Boufarik, Biskra, Ain Temouchent, Algeria). Capital) and homogeneity was performed for the research sample as in Table No. (1).

**Table (1)** It shows the homogeneity of the research sample

T	Measurements	X	S	Torsion coefficient	The result
1	height	185	8	0.535	homogeneous
2	the weight	83	14	0.882	homogeneous
3	the age	29	6	0.098	homogeneous
4	Training age	12	2	1.590	homogeneous

### **6.3- Data collection methods:**

- Tools used in the research:

The researcher used the means through which he could obtain the data and information required to solve his problem and achieve the objectives of his research because they are “the means by which the researcher can solve his problem, whatever it may be, and those tools are goals, data, samples, devices.”

For this reason, the researcher used:

- Measuring tape 50 meters long.
- A medical scale with a ruler to measure height and weight.
- Blood pressure and pulse measuring device.

### **6.4. Steps to design a performance effectiveness form:**

First: The performance effectiveness of basketball players was determined through:

- A- References and studies that dealt with performance effectiveness. After referring to many scientific references on basketball, the researcher developed 14 items for a form to evaluate performance effectiveness.
- B- Analyzing the performance effectiveness of basketball players using objective observation
- C- Getting to know the opinions of experts and specialists. The form was presented to experts and specialists in the field of basketball to identify the importance of the vocabulary for the effectiveness of positive and negative performance under study.
- D- Second: The themes and vocabulary included in the effectiveness of the performance were identified “because it is logical to use a method by which the phenomenon under study is addressed whenever it is divided into parts and the basic elements that make up it, as these parts are examined separately in order to achieve an understanding of the phenomenon as a whole.”

### **6.5. How to analyze the form:**

After establishing the axes to be measured, through which the data collection form was formulated, the method of calculating points was based on the positive and negative performance of the player during the match, as follows:

Each case in the positive performance vocabulary is given one positive point, except for successful scoring, which is given two points, and negative performance is given one negative point.

The results are dealt with according to the following equation:

$$\text{Player performance level} = \frac{(\text{Positive performance} - \text{negative performance})}{\text{The time the player participates in the match.}}$$

- Positive performance: These are all the successful movements, positions and skills performed by the player
- Negative performance: These are the failed movements, positions, and skills performed by the player.
- Actual time: during which the player participates in the match.

The form included two axes, one for evaluating positive performance and the other for evaluating negative performance, and by means of a theoretical evaluation of all the specific items committed by each player during one of the four rounds of the match. The observation form included the following items.

**The first axis: positive performance:**

- Successful scoring.
- Interrupting the ball when defending or attacking.
- Successful defensive follow-up.
- Successful offensive follow-up.
- A quick, successful attack.
- Assisted handling (to score two points).
- Take the appropriate place and score two points.

**The second axis: negative performance:**

- Failed scoring.
- Blocked tackles in defense and attack.
- Failed defensive follow-up.
- Failed attack follow-up.
- A quick, failed attack.
- Legal violations.
- Walking or stopping while playing.

**7- Measurements and tests used:**

- Identifying the physiological indicators under study and testing them:

After the researcher reviewed many sources and references concerned with functional tests and taking into account the opinions of specialists in testing these tests, a number of tests were tested to measure each of the functional indicators that were nominated, as follows: -

- 1- Short anaerobic endurance tests: 50-yard sprint test.
- 2- Aerobic capacity tests: Harvard step test (5 minutes).

**7.1. Measurements used:**

-Measuring heart rate and blood pressure:

The heart rate and blood pressure were measured using a blood pressure measuring device. This device is attached to the palm of the hand and gives pulse and pressure measurements, so that the measurement is done immediately after completing the physical effort and as quickly as possible. When measuring blood pressure, it should be taken into account that the person measuring it is sitting.

**7.2. Tests used:**

**-50-yard sprint test to test short anaerobic capacity:**

- Test objective: to measure short anaerobic capacity.

Description of the test: This test is performed using a moving start from a distance of 13.5 meters from the starting line. The tester runs at maximum speed from the moving line at a distance of 13.5 meters from the starting line. When he reaches the starting line, time calculations begin, the clock is started, and when the athlete reaches the finish line. At a distance of 50 yards from the starting line, the watch is stopped and the time is counted in seconds.

The capacity is calculated with the following equation:

$$\text{Short anaerobic capacity} = \frac{\text{Distance travel time in seconds}}{\text{Distance travel time in seconds}}$$

### Harvard 5-minute step test.

- Test objective: to measure aerobic capacity.

Description of the test: The tester stands facing the front of the box or bench at a height of (51 cm). When he gives the tester the start signal, he gets up and down on the box and does four repetitions: (1) placing one foot on the box, (2) placing both feet on the box, (3) Going down with the first foot on the ground (4) Both feet on the ground.

The laboratory must keep the body moderate and upright while going up and down on the chair and while standing on it.

The tester continues to rise and fall on the chair at a rate of 30 times per minute for (5) continuous minutes without stopping. When stopping occurs as a result of an inability to continue performing or as a result of feeling fatigued, in this case the tester is credited with the time he spent performing, noting that The total time of the test is 300 seconds (5 minutes). Long aerobic capacity was used to return to normal.

Registration: Aerobic capacity is calculated with the following equation

$$\text{Aerobic capacity} = \frac{\text{Number of seconds the tester takes to perform} \times 100}{2 \times \text{the number of times the pulse returns to normal}}$$

### 7.3. Scientific foundations of the tests used:

Validity of tests:

The test forms and the performance effectiveness form were presented to the experts and specialists and were nominated by them and obtained a 100% approval rate.

- Stability of tests:.

The researcher conducted a test on a sample of (5) players from the original research community on 12/4/2023, and the test was repeated on them after (7) days had passed. The simple Pearson correlation coefficient was used to find the reliability coefficient for the tests.

- Objectivity of tests:

It means that there is no influence on the subjective judgments of the experimenter, or that objectivity is present without bias and subjective interference on the part of the experimenter. The greater the degree of subjectivity on the test judgments, the less objectivity it has, and the more the subjective judgments are freed from influence, the greater the result of objectivity.

In order for the researcher to verify that the test has high objectivity, he sought to find a simple correlation coefficient between the judges' scores on the tests in order to ensure that the tests used have high objectivity. This is what confirmed to the researcher that the tests have high objectivity, as shown in Table No. (2).

**Table (2) shows the scientific foundations of the tests**

The test	objectivity of tests	stability of tests,
Short anaerobic power (50 yards)	0.96	0.98
Harvard Aerobic Capacity (5 minutes)	0.96	0.95

## **8. Main experience:**

The main experiment for the research sample was conducted during the period between 12/12/2022 and 1/5/2023. During this period, physical tests were conducted for the players of each team in the sample under the same conditions, and the performance effectiveness of the players was also obtained through scientific observation. For the matches of the first stage of the Algerian First Division Basketball Championship, during which the positive and negative performances were recorded for both competing teams, one match was chosen randomly from the total matches of the first stage, which were watched and analyzed using the form that was prepared specifically for observation and which was nominated by the experts and specialists, which were In this way, the effectiveness of the performance of each player from the research sample was obtained.

Tests were conducted for the players as follows:

### **First day :-**

1-Short anaerobic capacity test (phosphagenia) 50 yards.

My agencies:-

1- Measure the variables heart rate and blood pressure before giving physical tests.

2- Giving physical tests according to the anaerobic energy system.

3-Measure the variables heart rate and blood pressure immediately after completing the physical tests.

B- Prolonged anaerobic (lactic) capacity test, 60 seconds.

My agencies:-

1- Giving physical tests according to the tactical system.

2-Measure the variables heart rate and blood pressure immediately after completing the physical tests.

### **the second day :**

Aerobic capacity test (Harvard), 5 minutes, as follows:

1 - Giving physical tests according to the aerobic system.

2- Measure the variables heart rate and blood pressure immediately after completing the physical tests.

## **9. Statistical methods used:**

1- Arithmetic mean.

2- Standard deviation.

3- Percentage.

4- Analysis of variance (F).

5- Simple correlation (Pearson)

**10. presentation of results:**

10.1. Displaying the results of functional indicators before and after the effort, the performance level of the research sample:

**Table No. (3) shows the arithmetic means and standard deviations for the functional indicators and performance level for the research sample.**

S	X	Variables		
2.9750	61.9300	Heart rate	Before the effort	Physiological indicators
2.5658	132.000	Systolic blood pressure		
3.0173	84.87700	Diastolic blood pressure		
1.8820	12.6815	Short anaerobic capacity (50 yards)	After the effort	
2.9029	171.5200	Heart rate		
4.4583	178.7200	Systolic blood pressure		
2.5331	86.4000	Diastolic blood pressure		
2.5688	66.4332	Aerobic capacity (5 minutes)		
4.3558	159.1600	Heart rate		
3.8306	172.4400	Systolic blood pressure		
2.4953	66.3200	Diastolic blood pressure		
0.2891	0.1699		Performance level	

Table (3) shows the arithmetic mean of the heart rate before exertion, which reached (61.920 v/min) with a standard deviation of (2.985). The arithmetic mean of systolic blood pressure before exertion was (131 mm Hg) with a standard deviation of (2.565).

As for the arithmetic mean of diastolic blood pressure before exertion, it reached (83.880 mm.Hg) with a standard deviation of (3.018).

The table also shows the arithmetic mean of short-term anaerobic capacity, which amounted to (12.681 kg/s) with a standard deviation of (1.872). The arithmetic mean of the heart rate after exertion reached (171.520 V/min) with a standard deviation of (2.902), as well as the arithmetic mean of the systolic blood pressure rate after exertion reached (178.720 mm.Hg) with a standard deviation of (4.458). As for the arithmetic mean of the diastolic blood pressure rate after The voltage reached (86.4000 mm.Hg) with a standard deviation of (2.533).

The table also shows the arithmetic mean of the aerobic capacity (5 minutes), where the arithmetic mean of the heart rate after exertion was (159,600 V/min). With a standard deviation of (2.568), the arithmetic mean of systolic blood pressure reached (172.440 mm.Hg) and a standard deviation of (3.830). The arithmetic mean of diastolic blood pressure reached (66.320 mm.Hg) with a standard deviation of (2.495).

The table also showed the arithmetic mean of performance effectiveness for the research sample, which reached (0.169) with a standard deviation of (0.289).

**10.2.** Displaying the calculated and tabulated (F) value results for the functional indicators under study

**Table (4) shows the calculated and tabulated (F) value for the functional indicators for the research sample**

indicatio n	Calculat ed F value	Mean squares	Degree s of freedo m	Sets of squares	Source of variance	Functional indicators
aleatory	1.181	4.017	4	16.067	Between groups	Short anaerobic capacity (50 yards)
		3.412	20	68.038	Within groups	
aleatory	1.515	11.760	4	47.040	Between groups	Heart rate
		7.760	20	155.200	Within groups	
aleatory	2.245	36.960	4	147.480	Between groups	Systolic pressure blood
		16.46	20	329.200	Within groups	
aleatory	2.731	13.600	4	54.400	Between groups	Diastolic pressure blood
		4.980	20	99.600	Within groups	
		4.220	20	84.400	Between groups	
significant	11.769	27.786	4	111.146	Within groups	Aerobic capacity (5 minutes)
		2.361	20	47.219	Between groups	
significant	10.098	76.140	4	304.560	Within groups	Heart rate
		7.540	20	150.800	Between groups	
aleatory	0.838	12.640	4	50.560	Within groups	Systolic pressure blood
		15.080	20	301.600	Between groups	
significant	4.068	16.760	4	67.040	Within groups	Diastolic pressure blood
		4.120	20	82.400	Between groups	

After the effort

Table (4) shows the calculated (F) value for short anaerobic capacity, which amounted to (1.181) and the tabulated value (2.87) at a significance level (0.05) and with a degree of freedom (20.4). Since the calculated value is less than the tabulated value, therefore, there are no significant differences.

Table (4) shows the calculated (F) value for the heart rate after exertion, which amounted to (1.515) and the tabulated value (2.87) at a significance level (0.05) and with a degree of freedom (20.4). Since the calculated value is less than the tabulated value, there are no significant differences.

The table shows the calculated value of (F) for the average systolic blood pressure after exertion, which amounted to (2.245) and the tabulated value (2.87) at a significance level of (0.05) and with a degree of freedom (20.4). Since the calculated value is less than the tabulated value, therefore, there are no significant differences.

The table shows the calculated value of (F) for the average diastolic blood pressure after exertion, which amounted to (2.731) and the tabulated value (2.87) at a significance level of (0.05) and with a degree of freedom (20.4). Since the calculated value is less than the tabulated value, therefore, there are no significant differences.

The table shows the calculated (F) value for aerobic capacity, which amounted to (11.769) and the tabulated value (2.87) at a significance level of (0.05) and with a degree of freedom (20.4). Since the calculated value is greater than the tabulated value, therefore, there are significant differences.

The table shows the calculated (F) value for the heart rate after exertion, which amounted to (10.098) and the tabulated value (2.87) at a significance level (0.05) and with a degree of freedom (20.4). Since the calculated value is greater than the tabulated value, therefore, there are significant differences.

The table shows the calculated value of (F) for the average systolic blood pressure after exertion, which amounted to (0.838) and the tabulated value (2.87) at a significance level of (0.05) and with a degree of freedom (20.4). Since the calculated value is less than the tabulated value, therefore, there are no significant differences.

The table shows the calculated (F) value for diastolic blood pressure after exertion, which amounted to (4.068) and the tabulated value (2.87) at a significance level (0.05) and with a degree of freedom (20.4). Since the calculated value is greater than the tabulated value, therefore, there are significant differences.

10.3. Displaying the calculated and tabulated results of the performance level:

**Table (5) shows the calculated and tabulated (F) value for performance effectiveness for the research sample**

Source of variance	Sum of squares,	degrees of freedom	mean of squares	calculated (P) value	significance
Between groups	0.987	4	0.247	4.843	Significant
Within groups	1.019	20	0.0593		

Table (5) shows the calculated (F) value for performance effectiveness, which amounted to (4.843) and the tabulated value (2.87) at a significance level (0.05) and with a degree of freedom (20.4). Since the calculated value is greater than the tabulated value, therefore, there are significant differences.

**10.4. Presenting the results of the correlation between functional indicators and the performance level of the research sample:**

**Table (6) shows the correlation between functional indicators and performance effectiveness**

Functional indicators		Calculated correlation value
<b>after the effort</b>	<b>Short anaerobic power (50 yards)</b>	<b>0.314</b>
	<b>Heart rate</b>	<b>0.015</b>
	<b>Systolic blood pressure</b>	<b>0.130 -</b>
	<b>Diastolic blood pressure</b>	<b>0.093</b>
	<b>Aerobic capacity (5 minutes)</b>	<b>0.074</b>
	<b>Heart rate</b>	<b>0.164 -</b>
	<b>Systolic blood pressure</b>	<b>0.189</b>
	<b>Diastolic blood pressure</b>	<b>0.031 -</b>

Table (6) shows the correlation between the pulse rate before the effort, the performance level, as it reached (0.038), between the systolic blood pressure before the effort and the performance level, as it reached (-0.013), and the diastolic blood pressure before the effort, the performance level, as it reached (0.120).

The table shows the correlation between short-term anaerobic capacity and its indicator, the 50-yard test, and the level of performance, as it reached (0.314), and between the heart rate after the effort and the effectiveness of the performance, which amounted to (0.015), and between the systolic blood pressure after the effort and the level of performance, as it amounted to (-0.130), and between Diastolic blood pressure after exertion and performance level reached (0.093)

The table shows the correlation between aerobic capacity and its index, the 5-minute step test, with performance effectiveness, which reached (0.074), and between heart rate after exertion and the performance level, which reached (-0.164), and between systolic blood pressure after exertion and performance level, which reached (0.189), and blood pressure. Diastolic blood after exertion and performance level reached (-0.031)

**11. Discussing the results:**

- Discussing the results of the relationship between functional indicators and performance effectiveness of the research sample teams:

Table (6) shows the correlation between functional influences and performance effectiveness for the research sample, as it was found that there is a significant correlation between prolonged anaerobic (lactic) capacity and performance effectiveness, as the calculated (R) value was (0.403),

which is greater than the tabulated value of (0.396) at Significance level (0.05) and degree of freedom (23).

There is also a significant correlation between heart rate and pulse pressure for prolonged anaerobic capacity and performance effectiveness, as the calculated (R) value was (0.460) and (0.407), which is also greater than the tabulated value.

The researcher explains this by saying that long anaerobic energy is the basic energy of basketball players, as it is 90%, and this is what was previously mentioned, as the players' movements are characterized by speed to keep up with the performance requirements in competitions, which require moving from defense to attack, in addition to jumping, scoring, ball handling, and all of that. The movements made by the players may take a period between 15-60 seconds, and this time falls under the lactic acid system, which is the basic system in the game of basketball.

This is consistent with the study of (Latif Muhammad Kamal, 1992, p. 230) that these changes that accompany performance lead to functional adaptations among players that reflect the extent of their ability to continue playing without a decline in level, and this is what we observe in some of the clubs under study after the presentation of the research results, which It shows that there have been developments in aerobic and anaerobic capabilities through some functional indicators, and this results from the effect of the training loads to which the players were exposed, which was reflected in the development of the physical level of the players from the research sample.

This is what was indicated by (Hamdi Ahmed and Ghazi Al-Sayed) in that the physical loads imposed on the individual during the exercise of sports activity lead to functional changes in the vital systems, as rates of functional activity are increased to the extent that enables these systems to adapt to the physical loads, even if these effects It varies in varying proportions, depending on the amount of its percentage.

Despite the lack of a significant correlation in the rest of the functional indicators and performance effectiveness, the researcher believes the reason for this is due to the fact that there is a decline in the level of performance effectiveness for some members of the research sample, as the negative performance overcame their positive performance, which reflected negatively on the effectiveness of the members of the research sample despite the level of Good physical fitness, performance effectiveness was negative.

This is because performance effectiveness is the result of physical, skill, tactical, functional and moral performance processes. Therefore, (Issam Abdel Khaq: p. 13) confirms that analyzing the player's performance during the match and knowing the extent of his effectiveness is one of the things whose results can be inferred in the training processes that aim at the functional development of the body with the aim of adapting it through regular exercises that serve the requirements of performing a job.

## **12. Conclusions:**

- There is a significant correlation between prolonged anaerobic capacity and heart rate with the performance effectiveness of the research sample teams
- 2- There was no significant correlation between the short anaerobic (phosphagenic) capacity and the aerobic capacity with the performance effectiveness of the research sample teams.

## **13. Recommendations:**

- 1- Developing the elements of physical fitness, especially speed, speed endurance, and general endurance, during the training curricula, because they are closely related to blood pressure, heart rate, and the recovery process, while ensuring regularity in training.

2- It is necessary for coaches to use the performance effectiveness form modified by the researcher for the purpose of analyzing the players' performance, overcoming the shortcomings, and strengthening the positive aspects, and for the effectiveness of performance to be the main criterion for selecting players during matches, especially the national teams.

3- The necessity of using the functional tests under study by coaches when training and conducting blood pressure and heart rate measurements periodically to evaluate the training curricula and determine the physiological state of the players.

4- Emphasis on opening development and training courses for basketball coaches with the assistance of game experts from developed countries in the field of basketball, especially in the field of physiology, to clarify the importance of functional indicators during training and competitions. .

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