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The effect of special exercises on some physiological variables and endurance of skill performance in basketball

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Abstract

Some physiological variables associated with basketball players' health were assessed through the training curriculum, including systolic blood pressure, diastolic blood pressure, heart rate, breathing times, glucose levels, hemoglobin, hemoglobin, red blood cells, and white blood cells.

Basketball players' body weight, upper arm fat, Plate, and abdominal fat are all factors that a training approach can affect.

Through the results of this study, it was concluded that there is a positive effect of the training curriculum on the percentage of fat (upper arm, buttocks, and abdomen), weight in kilograms, sugar percentage, and number of white blood cells, as the differences between the pre-school stage and the school period.

The post-measurements were statistically significant and in favor of the post-measurement of these variables.

There is a negative effect of the training curriculum on the hemoglobin percentage, the hematocrit percentage, and the number of red blood cells, as the differences between the pre- and post-measurements were statistically significant and in favor of the pre-measurement. Of these variables, there is

no effect of the training curriculum on systolic and diastolic blood pressure, heart rate, and number of breathing times, and there are no statistically significant differences between the pre- and post-measurements of these variables.

As for the second and third conclusions, the researcher attributed this approach directly to the application of the training curriculum

Contents:

1 – 1 Introduction and importance of research:

The science of sports training and its importance and impact in finding appropriate solutions to problems and obstacles to raising the level of performance, which is a decisive factor in determining the level of achievement for all games, including basketball. Physical effort has been the subject of interest to scientists since ancient times, as they studied how bodies respond to physical effort, and observed Changes that occur to it, especially the positive effects of daily exercise (Amir, 1999, p. 251)

Basketball is the second most popular sport in the world, and while the anaerobic system makes up about 10%, the aerobic system makes up about 90% (Edward.2001.P.191). An effective training process requires careful planning and implementation of unique methods and techniques to achieve the desired results. In order to understand the degree and process of adaptation that occurs in the various body systems, precise laboratory experiments must be conducted during previous training (Darwish et al., 2002, p. 156), to conduct specific experiments focusing on each organ.

To ensure that the player continues to perform to his maximum potential and to monitor some of the physiological variables resulting from the required physical effort, it has become important to have a specific training curriculum.

1- 2 Research problem:

Basketball is considered a prominent sport in the world, and it comes in second place in terms of popularity, thanks to the participation of all clubs in the world in tournaments for all age groups, in addition to the lack of research on the game, and its scarcity at times. Research on the training curriculum

has also indicated physiological and physical standards for basketball players, although it is rare, it remains an important game. The researcher found that coaches do not pay much attention to these variables and therefore don't focus more on them while training players, which may affect their performance, and this is what led to the idea of this study.

1-3 Objectives of the study:

This study aimed to identify:

Some physiological variables associated with the health of basketball players were evaluated through the training curriculum, including systolic blood pressure, diastolic blood pressure, heart rate, breathing times, sugar levels, hemoglobin, hemoglobin, red blood cells, and white blood cells.

Basketball players' body weight, upper arm fat, Plate, and abdominal fat are all factors that training approach can affect

1-4 Study hypothesis:

Young players may be exposed to changes in physiological variables such as systolic blood pressure, diastolic blood pressure, number of heartbeats, number of breathing times, sugar, hemoglobin, red blood cells, and white blood cells, which the researcher found to be positively and negatively related to the training curricula.

In the research club, the weight of young players and fat in the upper arm, buttocks, and abdomen were affected by the training curriculum in basketball, according to the researcher.

1 - 5 Research areas:

1-5-1 Human Field: Five players from the club's youth basketball.

1-5-2 Spatial domain: The basketball court is the spatial domain for the area and time period in 2024

1-5-3 Time range: from 05-01-2024 to 15-05-2024.

1-5-2 Spatial field:

3- Research methodology and field procedures:

3-1 Research methodology:

To suit the purpose and nature of the study, the researcher chose the experimental method and designed a training program to select the study sample, followed by pre- and post-measurements.

3-2 Research community:

The study population included young basketball players.

3-3 Research sample:

Five young basketball players from the club volunteered as a sample to select the study sample, resulting in a random study sample

3-4 Devices and tools used in the research:

The set of study resources consists of a tool for storing test results and measurements for sample members, a medical scale for weighing weights, a tape for measuring height in centimeters, and an electronic stopwatch.

A mercury blood pressure monitor, a fat grip device, five basketballs, and an aerobics device.

3-5 Exploratory experience:

In the presence of the researcher, measurements were taken (diastolic and systolic blood pressure, number of heart beats (pulse), number of respirations, height, weight, and fat from the upper arm, pelvis, and abdomen), and blood samples were collected by a health laboratory employee in a hospital on the morning of 28/02/2024. The researcher measured blood pressure, heart rate, breathing time, height, weight, and fat content from different parts of the body, and collected data from the arm, Plate, and abdomen.

The researcher was present when a health laboratory employee, accompanied by a nurse, collected blood samples on the morning of April 14, 2024, for subsequent measurement, before the laboratory procedure. The preparation of the players has gone beyond the stage of general and specific physical preparation, and the researcher had the opportunity to present the team's preparatory curriculum to the researcher, who was a coach, after the team coach presented it, In addition to being a specialist in sports physiology, he has experience working at the international level, as a former coach for the national basketball team, he worked with injured and ill athletes during his two seasons in Canada. The following table shows the uniformity of sports physiology of the sample members.

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Table (1) shows the homogeneity of the sample

No.	Variables	Arithmetic mean	standard deviation	Coefficient of variation	Result
1	Age/years	19	0.75789	4.5468	homogeneous
2	Weight/kg	61.6	1.49987	2.6012	homogeneous
3	Length/cm	172	5.80014	3.2564	homogeneous
4	Training age/year	5	0.69789	15.2254	homogeneous

3-6 The main experiment:

The training program is affected by various independent variables.

Factors that depend on the outcome of multiple variables such as: (systolic blood pressure, diastolic blood pressure, number of heartbeats, number of respirations, sugar, hemoglobin, hemoglobin, red blood cells, white blood cells, weight, fat from the upper arm, plate and abdomen) .

3-7 Implementing the training curriculum:

The training period was between (01/03/2024 and 13/04/2024). The training curriculum took six weeks to complete, with a total of 24 training modules and four units per week. Each training unit lasted 90 minutes, and the training duration was five o'clock in the afternoon.

In the period before competitions and in the period of competitions and training, the training curriculum focused on technique and tactics in performance, which led to (17) training units with high intensity similar to competition, and (9) training units that increase competitive ability, and (4) other units were applied. . Training for the youth category in the Al-Ittihad Basketball Championship for regional clubs took place in conjunction with the Basketball Association Championship for the youth category.

3-8 Statistical methods:

The researcher used the statistical package (SPSS)

4-1 Presentation and discussion of the results:

This study aimed to identify the effect of the training curriculum on some physiological variables among young players in the club.

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Table (2) represents some physiological variables

Variable	Measurement	Arithmetic mean	standard deviation	Calculated "T" value	Significance level	Significance
Systolic blood pressure	Before	121	8	0.498	0.631	Insignificant
	After	119	4			
Diastolic blood pressure	Before	77	4	-1	0.415	Insignificant
	After	79	0.00			
Number of heartbeats	Before	65	3	1.633	0.169	Insignificant
	After	62	2			
Number of breathing times	Before	25	7	2.45	0.069	Insignificant
	After	21.9	6			

Table (2) shows the results related to the first hypothesis, and to answer the arithmetic means, standard deviations, and the T-test to show the differences between the pre- and post-measurements of the variables (systolic and diastolic blood pressure, number of heartbeats, and number of breathing times). We note from Table No. (2) that there are no statistically significant differences between the pre- and post-measurements

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Table (3) represents blood variables

Variable	Measurement	Arithmetic mean	standard deviation	Calculated "T" value	Significance level	Significance
Sugar	Before	80	6	4,125	*0.014	Significant
	After	77	5			
Hemoglobin	Before	15	0.87	7.11	*0.002	Insignificant
	After	14	0.88			
Hematocrit	Before	46%	2%	7,9-	*0.001	Insignificant
	After	48%	2%			
Red blood cells	Before	10×6^{6}	0.412×10^{6}	5,99	*0.002	Insignificant
	After	10×5^{6}	0.402×10^{6}			
White blood cells	Before	10×8^{6}	$10 \times 2,2^{6}$	4,50-	*0.012	Significant
	After	$10 \times 8,9^{6}$	10×2.2^{6}			

Arithmetic means, standard deviations, and T-test were calculated to show the differences between the pre- and post-measurements, in Table (3) for the variables (sugar, hemoglobin, hemoglobin, red blood cells, and white blood cells).

It is clear from Table (3) that there are statistically significant differences at the significance level ($\alpha = 0.05$) between the pre and post measurements and in favor of the post test for the variables of sugar and white blood cells only. As for the variables of hemoglobin, and red blood cells, the differences in them were in favor of the pre-measurement, and this can be explained by the

presence of a positive effect of the training program on the sugar variables. And white blood cells, as the sugar level decreased and the number of white blood cells increased.

The extent of the impact of the training curriculum on sugar levels is clear, as the percentage decreased after applying the training curriculum, which confirms the positive effect of the training curriculum on sugar levels

It is clear from the figure above the extent of the impact of the training curriculum on the number of white blood cells, as their number increased after applying the training program to about (4718) cells, which confirms the positive effect of the training curriculum on the number of white blood cells.

(The number 1 represents the measurement before the program and the number 2 represents the measurement after the program), while the effect of the training curriculum was negative on the variables of hemoglobin and red blood cells and hematocrit.

The extent of the impact of the training curriculum on the hemoglobin rate is clear, as the percentage decreased after implementing the training program, which confirms the negative impact of the training curriculum on the hemoglobin rate.

It is clear from the figure the extent of the impact of the training curriculum on the number of red blood cells, as their number decreased after applying the training curriculum to about (588,000) cells, which confirms the negative impact of the training curriculum on the number of red blood cells.

The extent of the impact of the training curriculum on the hematocrit rate is clear, as the percentage increased after applying the training curriculum, which

confirms the negative impact of the training curriculum on the hematocrit rate. These results are in agreement with the study of Al-Hammouri (2003), where his study indicated the presence of statistically significant differences between the pre- and The post- measurement with regard to the variables of sugar and white blood cells was in favor of the post-measurement, while it did not agree with its results with regard to the variables of hemoglobin and red blood cells. Its results also indicated that there were statistically significant differences between the two measurements, and in favor of the post-measurement of these variables.

The results of this study did not agree with the study of Landor et al (2002), as their results indicated that there were statistically significant differences between the pre- and post-measurements, and in favor of the post-measurement of hemoglobin and hematocrit variablesTable (4): represents some anthropometric variables

Variable		Measurement	Arithmetic mean	standard deviation	Calculated "T" value	Significance level	Significance
	Humerus	Before	8.9	1,21	10.609	0.000	Significant
		After	6.3	1.13			
	Plate	Before	10.7	1.31	13.865	0.000	Significant
		After	7.33	1,52			
	abdomen	Before	14.77	1.29	17.849	0.000	Significant
		After	10.36	0.87			
Weight kg		Before	60.55	1.49	6.49	0.002	Significant
		After	57.88	1.20			

Results related to the second hypothesis of Table (4)

From Table (4) shown above, we note that there are statistically significant differences for the variables of fat (arm, plate, abdomen), and weight. The differences in this variable were in favor of the post-measurement. This can be explained by saying that there is a positive effect of the training approach on the variables of fat and weight only, as the percentage of fat in the upper arm area decreased. Plate fat, abdominal fat, and weight showed statistically significant differences for the pre- and post-test measurements, and in favor of the post-test. And it went down. This confirms that training reduces the percentage of body fat.

The extent of the impact of the training curriculum on the percentage of fat is clear, as the percentage of humerus fat decreased after applying the training curriculum, as did the percentage of plate fat, and the weight decreased, which confirms the positive effect of the approach. Fat and weight training. The number 1 represents the measurement before the program, and the number 2 represents the measurement after the training curriculum for Figures 4 a, b, and c. This result agreed with the study of Al-Hammouri (2003).

The results indicated that there were statistically significant differences between the pre- and post-measurements regarding the fat variable, while there was no agreement in the results of the variables of systolic blood pressure, number of heart beats, and number of breathing times. The results also indicated that there were statistically significant differences in favor of the

post-measurement. For these variables, the diastolic blood pressure variable. The results were consistent with this study.

5- Conclusions and recommendations

5-1 Conclusions:

Through the results of this study, the researcher concluded the following:

1-

There is a positive effect of the training curriculum on the percentage of fat (upper arm, buttocks, and abdomen), weight in kilograms, sugar percentage, and number of white blood cells, as the differences between the pre-school stage and the school period. The post-measurements were statistically significant and in favor of the post-measurement of these variables.

2- There is a negative effect of the training curriculum on the hemoglobin percentage, the hematocrit percentage, and the number of red blood cells, as the differences between the pre- and post-measurements were statistically significant and in favor of the pre-measurement.

3- There is no effect of the training curriculum on systolic and diastolic blood pressure, heart rate, and breathing times, and there are no statistically significant differences between the pre- and post-measurements of these variables. As for the second and third conclusions, the researcher attributed this approach directly to the application of the training curriculum. It was prepared by him after reviewing the curriculum prepared by the club's youth coach, as well as shortening the duration of the program and increasing the training intensity included in the training units, as the game of basketball is

one of the games that depends on the aerobic system (oxygen) 90% and 10% on the anaerobic system. Which was mentioned in the introduction and before, (2001, ScottK.P0wers, Edward.T.p.191. Howley)

5-2 Recommendations:

1/ Coaches pay attention to good planning of training curricula because it is the basic foundation for improving the physical level of players

2/ Conducting medical physiological examinations continuously before and during the application of training curricula to observe the functional adaptation of vital organs.

3/ Repeat the same study but at a lower intensity

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