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The effect of high-intensity interval training on specific endurance and the skills of step back and fadeaway shoot in basketball for players aged (16-18) years

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Abstract

The process of physical, motor and skill preparation is considered the basic factors in the training process that have an effective impact on developing the level of players' performance, as the requirements of modern play have become more difficult and complex compared to the playing methods of previous years, as at the present time the basketball player's role is not limited to the center. Fixed, but participates in several tasks due to the high development in the level of attack and defense, as duties increased and the player was no longer able to play in a specific position. There are multiple methods and methods that work to develop players, and among these methods is the high-intensity interval method, which is considered one of the best appropriate and modern methods. Training in the high-intensity interval method relies on the principle of intensity frequency, in terms of sometimes rising to the intensity of the load and falling at other times.

Keywords: Step back skill, endurance speed, endurance performance

Introduction

Studying the effect of these exercises on personal endurance and the skills of step back and fade away shoot in basketball is one of the important elements that benefit the player to achieve athletic achievement. The high-intensity interval method, which works to develop physical, motor, and skill abilities, has a major role in improving personal endurance through increasing the efficiency of the circulatory, respiratory and cardiac systems. The game of basketball has a fast pace and a long time, and this game requires a respiratory system and healthy lungs, as the player has special endurance and special endurance sections, for example (speed endurance and performance endurance), which contribute to developing the skills of this game when performing it. Basketball is also a game. It contains many skills, and some of these skills are (Step Back and Fadeaway Shoot). These skills are performed in response to unexpected factors and variables that require a high level of strength, speed, and accuracy. The importance of using offensive skills in basketball increases as they are decisive in achieving goals in which performance is required to be controlled with precision, strength and speed, as these skills require players who have good physical abilities and are the primary determinant of the success of the skill. Hence the importance of research in preparing high-intensity interval style exercises for special endurance and the skills of step back and fadeaway shoot in basketball for players aged (16-18) years as a serious step to improve the physical, tactical and skill reality through combined exercises and in the manner mentioned above.

Research Problem

The game of basketball has developed a lot in recent years due to changing some laws and rules, which made the game faster and more exciting. This development, based on the presence of elements and physical abilities, gave skill performance the characteristic of continuity without decreasing in level. Through this research, the researcher tried to answer about some questions, the most important of which are:

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1. Knowing the players' levels of endurance (Performance endurance and speed endurance).
2. Knowing the players' levels of the Step Back skill.
3. Knowing the players' levels of the fadeaway shoot skill?
4. Knowing the effect of high-intensity interval training exercises for basketball players aged (16-18) years.

Research Aims

1. Preparing high-intensity interval training exercises for special endurance and the skills of step back and fadeaway shoot in basketball for players aged (16-18) years.
2. Identify the effect of high-intensity interval training on endurance and the skills of step back and fadeaway shoot in basketball for players aged (16-18) years.

Research Hypotheses

1. There is an effect of high-intensity interval training in developing endurance and the skills of step back and

- fadeaway shoot in basketball for players aged (16-18) years.
2. There is a preference in the effect of high-intensity interval training on special endurance and the skills of step back and fadeaway shoot in basketball for players aged (16-18) years between the pre-test and post-test.

Research Scopes

- **Human Field:** Al-Hilla Sports Club players in youth basketball for the sports season (2023-2024).
- **Time Frame:** The Period from 2/17/2023 until 6/15/2024.
- **Spatial Area:** Sports Talent Hall.

Research Methodology and Its Practical Procedures

Research Methodology: The researcher used the experimental method (two equal groups) as it is the most appropriate method to solve the research problem.

Table 1: The Experimental design of the research groups

Group	Pre-test	Experimental Treatment	Post-test
Experimental	Special stamina and the skills Step Back and Fadeaway Shoot	High-intensity interval style exercises	Special stamina and the skills Step Back and Fadeaway Shoot
Controlling	Special stamina and the skills Step Back and Fadeaway Shoot	Exercises prepared by the trainer	Special stamina and the skills Step Back and Fadeaway Shoot

Research Community

The research community included Al-Hilla Sports Club players aged (16-18) years, with (20) players. The community was divided into two groups, one experimental and the other a control group, each group consisting of (10) players.

Methods, tools and instruments used in research

Means of collecting information

1. Personal interviews.
2. References and sources.
3. The Internet.
4. Tests and measurement.
5. Registration form.

Description of the tests used in the research

Speed endurance test

- 40-second running test.
- **Objective of the test:** To measure speed endurance.
- **Location:** Basketball court divided into meters from 0 to 28 metres.
- **Tools used:** Stopwatch whistle.
- **Performance method:** Starting from a high position, where the player stands with both feet behind the start (The final line of the basketball court) and after the tester gives a word of readiness. He gives instructions to the player to go at full speed to the end of the arena and then return in the same way to the starting point, and so on back and forth until the end of the time period specified in 40 seconds.
- **Performance conditions:** The player must touch the final line with one of his feet while going back and forth.
- **Recording:** The distance the player covers during the specified time is calculated to the nearest meter the player has passed.

Performance endurance test (Peaceful aiming skill)

1. Peaceful aiming test for (30) seconds

- **Purpose of the test:** to measure the endurance of peaceful shooting.
- **Description of the performance:** The experimenter stands at the free throw line, holding the ball in his hands, and when he hears the whistle, he performs the safe shot in any direction he desires. Then he returns to take a second ball on the chair and at the free throw line to complete the safe shot for up to (30) seconds, knowing that he leaves the ball after that shot for a player to do. Another to put her back on the chair
- **Registration:** One point is counted for each successful injury, and the number represents the number of injuries that achieved their goals within (30).

Skill Test: Step back shoot

Test name: Step back shoot test

Purpose of the test: To measure the performance of the Step Back Shoot skill

Equipment and tools: (1) basketball, whistle

Description of the performance: The player stands with the ball in the middle circle of the court, facing the basket and the defending player. Upon hearing the start signal, the player performs the skill of tapping towards the basket. Upon reaching the defensive player, who is standing at the border of the three-point line, he tries to move forward to inspire the defensive player to penetrate, so the attacking player steps. Step on the instep of the front foot and rest on it, then press and push with the same foot and step back with a jump back and in the opposite direction to get away from the defending player who is moving in the direction of the attacking player's penetration after the attacking player gains the required distance, he jumps and shoots at the basket, as shown in the figure below:



Fig 1: Technical performance of the step back shoot skill

Registration

Registration is done according to the form to evaluate the actual performance of the step back shoot skill, as shown below:

Table 2: Technical performance of the step back shoot skill

No.	Name of Player	Plumpness	Tricking	Shooting Performance	Shooting Result	Total
1.		2 Degree	5 Degree	3 Degree	2 Degree	12 Degree

Second: Testing the turnaround fadeaway shoot skill

- **Test name:** Turnaround Fadeaway Shoot test.
- **Purpose of the test:** To measure the performance of the Turnaround Fadeaway Shoot skill.
- **Equipment and tools:** (1) basketball, whistle.

Description of the performance

The player stands with the ball on the three-point line with his side (Shoulder) to the basket and is defended by a defender in a man-to-man manner. When the start signal is heard, the player performs the skill of tapping and moving sideways towards the defending player and trying to continue to put pressure on him and bring him back by moving with the side tap to the inside. Then he takes a final step, which is somewhat wide, in which the front foot is in a state of slight flexion, while the trailing foot is fully extended, and there is an inclining of the trunk inward, and the leading shoulder and head are along the vertical line of the leading foot. Then, a complete backward rotation is made, and the fulcrum of this rotation is the trailing foot. A distance is created with the defending player as a result of the complete rotation. Then the player faces the basket and jumps backwards to move further away from the defending player and aim toward the basket, as shown in the figure (below).



Fig 2: Technical performance of the turnaround fadeaway shoot skill

Registration

Registration is done according to the form to evaluate the actual performance of the Turnaround Fadeaway Shoot skill, as in the previous Figure.

Exploratory experiment

Before undertaking the main experiment, it was necessary to conduct a reconnaissance experiment on a small sample in the research community. Its purpose was to test the research methods and tools, and to experiment with physical and mental exercises and how to apply them, as well as to know all the difficulties that the researcher would face. The experiment was implemented on Friday, February 23, 2024.

Pre-test

The pre-test for the research sample was conducted on Monday, February 26, 2024, at exactly 4 p.m., and all variables were controlled in terms of time, tools and devices, as well as the supporting work team, to be applied when conducting the (post-test).

Main Experiment

After conducting the pre-test, the researcher applied the exercises to the experimental research group on Wednesday, March 2, 2024, for a period of 8 weeks.

1. The total number of training units for high-intensity interval training exercises is (24) units.
2. The number of weekly training units included in the high-intensity interval training exercises is (3) units for a period of (8) weeks.
3. The time of high-intensity interval training exercises in the training unit is (30-40) minutes (in the special preparation period).
4. The training days during the week are (Wednesday, Saturday, Monday), as these days are compatible with the nature of the program that was developed by the researcher and in agreement with the trainer so that there is no intersection in the training units. In addition, these days are compatible with the fluctuation that Drawn for the training week.

5. The goal of high-intensity interval training is to develop the elements of special endurance (speed endurance and performance endurance), which are directly related to offensive skills in basketball.
6. Intensity was determined by time, repetition, and weights for high-intensity interval training exercises
7. The maximum intensity (100%) was extracted for each exercise in order to draw the curriculum and training units.

Post-test

After completing the implementation of the exercises in a high-intensity, frequent manner, the post-test was conducted for the experimental group on Saturday, May 4, 2024, at 4 pm, taking into account all the temporal and spatial

conditions of the pre-test with the help of the work team. The post-test was applied to the Talent Sports Hall.

Statistical methods used

1. Arithmetic mean.
2. Standard deviation.
3. Coefficient of variation.
4. Simple correlation (Pearson).
5. Test (T-TEST) for independent samples.

Section Four

Presentation, analysis and discussion of the results

Presentation of the results of the special endurance tests and the skills of step back and fadeaway shoot with basketball (for the experimental group)

Table 3: The values of the median and the spring deviation for the pre- and post-tests, and the calculated T value and its statistical significance for the results of the special endurance tests and the step back and fadeaway shoot skills in basketball and for the experimental group

Sig.	Sig. Value	T	Sample Size	Posttest		Pretest		Test
				G	H	G	H	
Significant	0.0000	12.87	8	4.89	186.08	5.61	165.12	Endurance speed
Significant	0.000	4.754	8	0.97	7.08	0.876	4.85	Endurance Performance
Significant	0.001	4.913	8	0.485	9.01	0.711	6.51	step Back
Significant	0.000	5.85	8	0.532	7.96	0.499	5.85	Turnaround Fadeaway Shoot

By looking at Table (2) for the tests for the experimental group, we find that there is a difference between the pre- and post-tests for the experimental research group, which indicates that there are significant differences.

Presentation of the results of the post-tests and the calculated T-value for the results of the special endurance tests and the skills of step back and fadeaway shoot in basketball for the experimental and control groups

Table 4: The values of the median and the spring deviation of the post-test and the calculated T value and its statistical significance for the results of the special endurance tests and the step back and fadeaway shoot skills in basketball (For the control and experimental group)

Sig.	Sig. Value	T	Sample Size	Posttest		Pretest		Test
				G	H	G	H	
Significant	0.0001	11	8	4.89	186.08	4.95	167.34	Endurance Speed
Significant	0.009	0.5	8	0.97	7.08	0.92	5.43	Endurance Performance
Significant	0.004	0.7	8	0.485	9.01	0.476	7.60	Step Back
Significant	0.008	0.9	8	0.532	7.96	0.5652	6.50	Turnaround Fadeaway Shoot

By reviewing Table 3, which shows the value of the median, interquartile deviation, and T for the collective defensive skills test, it is clear that there are significant differences in favor of the experimental group.

Results Discussion

From the previous incidents, it is clear that there is a clear difference in the special endurance and skills of step back and fadeaway shoot in basketball for players aged (16-18) years in basketball for the control and experimental group. The researcher attributes the reason for the development that occurred in the control group to the influence of the regular curriculum set by the coach in addition to the continuity and regularity of the players. In the training units, the development achieved by the experimental group in Special Forces and some complex offensive skills. The researcher attributes the reason for this development to the development of the strength elements of young players, where exercises in a frequent, high-intensity style are consistent with the goal set, as endurance of speed and endurance of performance are among the important abilities for the success of the attack in general because they work to create spaces so that the attacker can shoot well and score.

Points in difficult situations and in the presence of defenders.” In addition, the exercises used took on a new character in incorporating the special strength exercises that the player needs to perform any basketball skill, as well as the researched skills (Step Back, Fadeaway Shoot) in one exercise, which are similar to actual playing situations. A conscious striker who is aware of modern playing methods must know that these skills are extremely important. Also, the exercises prepared by the researcher work to increase the attacking player’s understanding of playing with or without the ball and create distance between the defender and the attacker who is in the area that that defender is responsible for. In this case, it is necessary, the attacker must constantly adjust his body position so that he is at the top of the triangle with his base on the passing pressure between the ball and the attacker, so that he can always see both the ball and the attacker at the same time.

Section five

Conclusions and Recommendations

Conclusions

Based on the results of the study, the conclusions were:

1. There is a development of special endurance and some offensive skills discussed (Step back and fadeaway shoot) for young players aged (16-18) years in basketball for the experimental group and the control group.
2. From what the research results showed, there is a clear and real effect of high-intensity repetitive exercises in developing special endurance and the skills of step back and fadeaway shoot for young football players.

Recommendations

Based on the previous conclusions, the researcher recommends:

1. Interest in developing the offensive skills of young basketball players.
2. Interest in developing physical abilities in a way that precedes and accompanies the development of defensive and offensive skills for young basketball players.

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