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The Effects of Skill and Physical Exercises on Developing the Explosive Power and Agility of Youth Basketball Players Defensive Skills

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Abstract: *This study aims at elaborating and identifying skill – physical exercises on the development of the explosive power and agility of the basketball defensive skills. The sample of the study was determined through youth players in the National Center for Sport Talent Care of Basketball (2018-2019), at ages ranging from 16 to 17 years old. The researcher used some tests, tools and assistive devices to assist him in completing the research, and he adopted the curriculum prepared by the coach, through which the researcher introduced the proposed curriculum within the applied aspect in the training module. The proposed training curriculum included special exercises for 8 weeks, starting from 09/03/2019 to 12/05/2019, and by 3 training modules per week. The most important conclusions reached by the researcher are: the emergence of significant differences in the post tests of the explosive power and agility of defensive skills. The most important recommendations of the researcher are the use of special exercises, which showed positive results, the use of new methods and techniques in training in order to develop the game.*

Keywords: *Physical Exercises , Basketball , Explosive Power , Defensive Skills.*

I. INTRODUCTION

Basketball is one of the different team sports, which is one of the most popular games, and it is ranked the first in some countries of the world among their other games due to the splendid combination of artistic performance and fast rhythm which attracts the audience and its followers.

The recent years witnessed a remarkable development in this game, where there were multiple methods and forms of attack, which called for the multiplicity and diversity of methods and forms of defense, and the emphasis on the effective defense in basketball game has become a clear feature of modern basketball game. Many coaches believe that the best way to win the game is achieved through a vigilant defense; the team with a cohesive defense can largely control the outcome of the match.

This requires the preparation of special exercises for the development of physical and kinetic capabilities in accordance with the scientific foundations being the basis of the effective defense. From this objective understanding of the importance of combined exercises for this age group, being a specialized building stage that stand-alone and a broad base to reaching the higher levels, the importance of this research paper came, through complex exercise numbers in the development of some physical and kinetic capabilities and defensive skills of youth basketball players.

II. RESEARCH PROBLEM

The effort exerted by the player during the games is not limited to the physical and skills aspects only, but there is a full interaction and linkage between all aspects of physical, artistic, tactical, psychological and mental preparations. In order for the exercises used by the coach to be effective with multiple benefits not limited to one aspect without the

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other, he should use compound exercises (skill - physical), which will play a large role in the development of the aspects of the numbers mentioned. For the fact that the researcher is a player and a coach, he noted poor performance of defensive skills of the youth players, accompanied by weakness and neglect of physical and kinetic capabilities that greatly contribute to producing this skill with such form.

III. RESEARCH OBJECTIVES

1- Preparing skill – physical exercises to develop some explosive capabilities of the feet and agility of the defensive skills of youth basketball players.

2 - Identifying the effects of the skill – physical exercises to develop some of the explosive capabilities of the feet and agility of the defensive skills of youth basketball players.

IV. RESEARCH METHODOLOGY AND ITS FIELD PROCEDURES

1. Vertical jump test of stability[2]

Purpose of the test: to measure the explosive power of the muscles of the legs.

Tools and capabilities: A leather belt wrapped around the player's center, measuring tape, a piece of metal with a hole through which the measure tape passes, a loop attached to the belt through which the measuring tape passes and adhesive tape.

Performance description: At the center of a circle drawn with a diameter of 50 cm, a small metal piece shall be attached to the measuring tape. The metal piece should stand between the legs of the player who wears a belt as much as the circumference of his waist. The end of the tape is connected with a loop attached to the leather belt; the tape extends to the metal piece and is completely tight. The player stands with his legs stretched without flexion in the knees. After reading is determined in centimeters at the middle of the metal piece, the athlete is required to jump with the feet together and the arms can swing.

The measuring tape moves upwards and then there will be a new reading at the middle of the metal piece, the difference between the two readings is the result of the explosive power of the athlete.

(Note that the result of the jump that ends outside the drawn circle is not counted).

Test management

Registrar: Calls on the names and records the results.

Arbitrator: Calculates the grades and notices the call.

Grades calculation: The degree obtained by the player is the number of centimeters between the first reading, while standing, and the second reading after jumping.

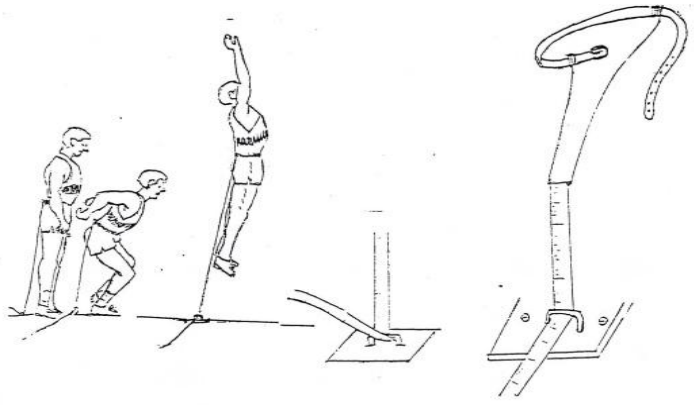

Figure 1: The vertical jump test of stability using the Abalakov belt.

2. Agility test

Zigzag running between cones.

Purpose of the test: Agility Measurement.
Tools and capabilities: 5 pillars and a stopwatch.

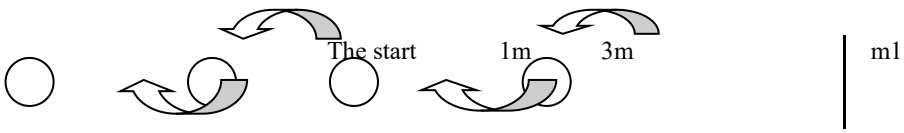

Figure 2: Agility test

Test procedures: from standing at the starting line (one meter wide) which is away from the first barrier by 3 meters - running between the four pillars which distance is of one meter between each pillar and the other, calculated for the player the time in the two rounds.

Grades calculation: The time for two continuous rounds is the indication of agility.

Skill tests

1. Basketball guard movement test

Purpose of the test: Measuring the time of movement of the basketball guard.

Tools and capabilities: A legal basketball court, 5 pillars, 2 stopwatches and measuring tape.

Procedures: The first pillar shall be placed outside the free throw area (on the edge of the free throw circle), the second and third pillars shall be placed outside the free zone (the extension of the free throw line). The fourth and fifth pillars are placed in the specified location on both sides of the court near the corner of the court, and each pillar is 7 meters distance from the starting point.

Performance description: When hearing the start signal, the player moves in defensive steps from the midpoint of the distance between the fourth and fifth pillars down the target forward until he touches the first pillar and then returns back with the same steps to the starting point, then moves with defensive steps forward until touching the second pillar and returning with defensive steps up to the starting point, then to the third pillar and back to the starting point and then to the side steps to the fourth pillar and back by side steps until touching the fifth pillar passing through the starting point and then back to the starting point.

2- Defensive follow-up test[3]

Tools and capabilities: Basketball goal, basketball and stopwatch.

Performance description: The player stands at a distance of 3 meters from the goal on which a line is drawn that is parallel to the ground, and at an altitude of 3 the player throws the ball with two hands or with single hand in the direction of the goal and above this line, then advances to pull the rebound ball from the highest point of the goal and returns again to the starting line and repeats the same attempt for one minute.

Recording: The number of attempts in which the ball touches the target above the line drawn is counted in the specified time period.

3.4 Sample equivalence procedures

In order for both groups to start from one point of initiation, the researcher conducted the process of equivalence of the two groups.

Table 1

The equivalence of the two groups in the dependent variables

(physical, kinetic and skill)

	Variables	Measurement unit	Control group		Experimental group		Mann-Whitney Test		Significance type
			Median	quartile deviation	median	quartile deviation	Calculated	Scheduled	
	Explosive power	Cm	32.5	13.5	37.5	6	10	0.120	Insignificant
	Agility	sec	18.08	0.025	17.97	0.97	16	0.409	Insignificant
	Feet defensive movement	sec	24.2	0.89	24.28	1,36	17.5	0.531	Insignificant
	Defensive follow-up	Repetition	12	2.8	12	2	16,5	0.469	Insignificant
Significance level 0.05									

The above table shows that the differences in the tests (agility, defensive follow-up, explosive power of legs muscles and the movement of the defensive feet) between the control and experimental groups are insignificant (random), and this indicates the equivalence of the two research groups. Given that all of Mann-Whitney calculated values are greater than the scheduled value.

Pre-Tests

The researcher conducted the pre-tests of the research sample, which took place on Tuesday and Wednesday, 2-3 /03/2019, at 4:00 pm in the hall of the National Center for Sports Talent Care of Basketball in Baghdad province, where the skill tests were conducted, and on the next day the kinetic and physical tests were conducted in the same hall.

Post-tests:

After the completing the carrying out of the special exercises, post-tests were conducted on Sunday and Monday 15-16 / 05/2019, at 4pm, at Al-Shaheed Hamza Nouri Hall, with two groups: control and experimental, taking into account the same organization and conditions for the implementation of tests and under the same conditions and capabilities used in the pre-tests, for the purpose of obtaining accurate results.

Presentation, analysis and discussion of findings

After data collection and statistical processing, the researcher reached a number of results, which are presented in tabular form.

1. Presentation and analysis of the explosive power and agility results for the experimental group

Table 2 shows the median and quartile deviation values of the pre- and post-tests and the Wilcoxon calculated value and their statistical significance for the explosive power and agility test results of the experimental group.

		Pre-test	**Post-test**				

Description	Test	Median	Quartile deviation	Median	Quartile deviation	Sample size	Wilcoxon calculated value	Wilcoxon scheduled value	Significance type
Explosive power	**Adjusted vertical jump test**	**36.5**	**6**	**43**	**5.37**	**6**	**Zero**	**Zero**	**significant**
agility	**Zigzag running between cones**	**17.87**	**0.97**	**15.43**	**0.50**	**6**	**Zero**	**Zero**	**significant**
Significance level 0.025									

By reviewing table 2 of the explosive power test for the experimental group, we find that in the pre-test the median value reached 36.5 with 6 quartile deviation. As for the post-test, the median was 43 with 5.37 quartile deviation, and that indicates the difference between the two tests. To illustrate the reality of these differences, the researcher used the non-parameter test (Wilcoxon test) for analog samples. Hence, Wilcoxon calculated value was zero at 0.025 level of significance for a 6 size sample. Thus there are significant differences in favor of the post-test.

As for the agility test for the experimental group, we find that the pre-test was 17.87 with quartile deviation 0.97. In the post-test, the median was 15.43 with a quartile deviation of 0.50. This indicates the differences between the two tests. To illustrate the reality of these differences, the researcher used the non-parameter test (Wilcoxon test) for analog samples. Hence, Wilcoxon calculated value was zero at 0.025 level of significance and for a 6 size sample. Thus there are significant differences in favor of the post-test.

2. Presentation and analysis of the explosive power and agility results for the control group

Table 3 shows the median and quartile deviation values of the pre- and post-tests and the Wilcoxon calculated value and their statistical significance for the explosive power and agility test results of the control group.

Description	Test	Pre-test		Post-test		Sample size	Wilcoxon calculated value	Wilcoxon scheduled value	Significance type
		Median	Quartile deviation	Median	Quartile deviation				

Explosive power	Adjusted vertical jump test	32.5	13.5	43	35	6	Zero	Zero	significant
Agility	Zigzag running between cones	18.08	0.025	17.26	0.31	6	Zero	Zero	significant
Significance level 0.025									

By reviewing table 3 of the explosive power test for the control group, we find that in the pre-test the median value reached 32.5 with 13.5 quartile deviation. As for the post-test, the median was 35 with 5.75 quartile deviation, and that indicates the difference between the two tests. To illustrate the reality of these differences, the researcher used the non-parameter test (Wilcoxon test) for analog samples. Hence, Wilcoxon calculated value was zero at 0.025 level of significance for a 6 size sample. Thus there are significant differences in favor of the post-test.

As for the agility test for the control group, we find that the pre-test was 18.08 with quartile deviation 0.025. In the post-test, the median was 17.26 with a quartile deviation of 0.31. This indicates the differences between the two tests. To illustrate the reality of these differences, the researcher used the non-parameter test (Wilcoxon test) for analog samples. Hence, Wilcoxon calculated value was zero at 0.025 level of significance for a 6 size sample. Thus there are significant differences in favor of the post-test.

3. Presentation of the defensive skills test results for the experimental group

Table 4 shows the median and quartile deviation values of the pre- and post-tests and the Wilcoxon calculated value and its statistical significance for the defensive skills results of the of basketball for the experimental group

Skill	**Test**	**Pre-test**		**Post-test**		**Sample size**	**Wilcoxon calculated value**	**Wilcoxon scheduled value**	**Significance type**
		Median	**Quartile deviation**	**Median**	**Quartile deviation**				
Defensive follow-up	**Defensive follow-up test**	**12**	**2**	**13.75**	**1.37**	**6**	**Zero**	**Zero**	**significant**
Defensive	**Defensiv**	**24.28**	**1.36**	**21.98**	**0.47**	**6**	**Zero**	**Zero**	**significant**

foot work	**e foot wor k (slid e)**								
Significance level 0.025									

By reviewing table 4 of the defensive follow-up test for the experimental group, we find that in the pre-test the median value reached 12 with 2 quartile deviation. As for the post-test, the median was 13.75 with 1.37 quartile deviation, and that indicates the difference between the two tests. To illustrate the reality of these differences, the researcher used the non-parameter test (Wilcoxon test) for analog samples. Hence, Wilcoxon calculated value was zero at 0.025 level of significance for a 6 size sample. Thus there are significant differences in favor of the post-test.

As for the defensive footwork test, the median value in the pre-test was 24.28 with quartile deviation 1.36. In the post-test, the median was 21.98 with a quartile deviation of 0.43. This indicates the differences between the two tests. To illustrate the reality of these differences, the researcher used the non-parameter test (Wilcoxon test) for analog samples. Hence, Wilcoxon calculated value was zero at 0.025 level of significance for a 6 size sample. Thus there are significant differences in favor of the post-test.

V. CONCLUSIONS

The conclusions in the light of the findings reached by the study were:

1 - There is an evolution in the explosive power, agility and defensive skills of basketball players (experimental and control groups).

2- The findings of the study showed that there is a clear and real influence of special exercises using training tools in the development of explosive power, agility and defensive skills of basketball players.

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