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Special skill exercises to develop mechanical movement behavior and the accuracy of Setting skill performance for volleyball players

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Abstract:

The intentional research sample consisted of the players of the Specialized Center for the Care of Sports Talent for Volleyball at the Ministry of Youth and Sports in Baghdad. They reached (6) athletes. The researchers used special skill exercises to develop mechanical movement behavior and the accuracy of the performance of the preparation skill. The kinetic analysis program (Kinovea) was also used, in order to extract the kinematic variables of the setting skill. The accuracy test of numbers close to the network was used to measure the accuracy of the setting skill of the setting players in volleyball. The aim of the research was to identify the effect of special skill exercises on the mechanical variables (as mechanical movement behavior) and the accuracy of the setting skill of the setting players In volleyball. The sample members were characterized by the highest accuracy of numbers, and mechanical variables (as mechanical behavior) improved as a result of the effect of special skill exercises.

Key words: *exercises, mechanical behavior, accuracy of setting, volleyball*

I. Introduction:

Setting skill is one of the important skills in volleyball. It is the link between defensive and offensive skills, and on it the successful attack of the team depends, as it is a "directed technical performance, intended to create an ideal attack, and according to this topic performs the skill from various positions and positions of the body" [1] In addition, it is considered a tactical skill associated with crafting the offensive tactical sentences performed by the team's players “is the tactical skill of putting the ball in a position where a teammate can initiate an attack”[2]. “One of the most exciting aspects of playing volleyball is winning a point with an accurate pass, an on-target set, and a perfectly placed attack”[3]. The player who specializes in performing the preparation skill on the field is the prepared player who coaches are interested in choosing and training him intensively and specialized, and that he is within special specifications that relate the team's success in its performance to the strength of the prepared player's performance, so it is” When asked to describe the necessary traits of a setter,

coaches are likely to offer a variety of responses, including golden hands, nerves of steel, thick skin, leader of the pack, team quarterback, or better yet, a coach on the floor"[4].

The accuracy of the setting skill is a basic and decisive factor, through the mastery of the player for the setting skill that makes him able to carry out the planning duties, camouflaging the wall to block the opposing team, and placing the attacking player in a suitable position to perform the attack. "Since there is no point in performing strong and fast if the player lacks this element that integrates with him the ability to act appropriately in directing the ball in the direction, height and appropriate dimension that enables the attacker to perform the spike" [5].

The special skill exercises related to the development of the foundations and mechanical variables of skill performance such as mechanical movement behavior for any game, especially volleyball, for all its skills, including setting skill, is of great importance, since "the exercise has multiple benefits as it works to operate the largest possible number of muscles and continues to improve old skills and develop new skills to reach To automated compatibility, Since there are multiple factors influencing the exercise, one of which is knowledge of mechanical principles and concepts related to performance" [6].

The research problem lies in the lack of interest of trainers in making special skill exercises to develop the kinetic behavior of the setting player by emphasizing the development of the mechanical variables related to the performance of the setting player(the setter). This appears through his mechanical movement behavior, which affects the accuracy of his performance of the setting skill.

The aim of the research is to identify the effect of special skill exercises on mechanical variables (as mechanical kinetic behavior) and the accuracy of setting skill for the setters in volleyball.

The researcher assumed that there is a positive effect of special skill exercises on mechanical variables (as mechanical behavior) and the accuracy of the setting skill.

II. Materials and method:

The research sample was chosen by the deliberate method. The players are setters in the Specialized Center for the Care of Sports Talent for Volleyball in the Ministry of Youth and Sports / Baghdad, who are (6), and ages (16_18) years. Table (1) shows the homogeneity of the research sample in (age- length- Weight - training age).

Table(1)

No	Variables	Mean	Std.Deviation	Mode	Skewness
1	Age (year)	17.33	0.816	18.00	- 0.857
2	Length (cm)	182.33	2.875	185.00	- 0.651

3	**Weight (kg)**	**72.16**	**2.714**	**74.00**	**- 0.712**
4	**training age (year)**	**5.33**	**0.816**	**6.00**	**- 0.857**

It is evident from Table (1) that the skewness of the research sample was confined to (± 3) in the measurements of (age - height - weight - training age), which indicates the homogeneity of the research sample.

-Devices and tools used:

1-Electronic stopwatch,(SEWAN) no.(2).

2-legal volleyball,(noMIKASA),.(30)

3-Colored adhesive tape, no. (5) .

4-A measure tape,no.(1).

5-Video camera (SONY),no.(1) .

6-Swiss Ball, no.(6) .

7-Training chairs and terraces,no.(6)

8-Rubber cords .

- mechanical variables:

Kinovea,a movement analysis program was used to extract the adopted kinematic variables (such as mechanical behavior) for the setting skill. The research sample was filmed in the pre and post search experiments with a high-frequency video camera (sony) and the frequency was set to (140) images per second. The camera was placed perpendicular to the left side of the setter. It was at a distance of (7.80 m) and a height (1.50 m) from the ground.

The mechanical variables were extracted as follows:

-Ball launch velocity: measured by dividing the launch distance by the launch time.

-The highest height of the ball when touching it with the hands: it is measured by calculating the highest vertical distance of the point of the hip joint from the level of the platform when the ball was touched.

-The angle of the knees:it is measured by calculating the moment of greatest bending of the knees, which is the angle between the thigh and the leg. It is measured from the side towards the bending.

-The angle of the shoulders:it is measured by calculating the moment of touching the ball . It is the angle between the arms and the torso and is measured from the side towards the crease.

-The angular velocity of the knees (x g the knees): It is measured by dividing the angular change of the knee joint by the change in time from the largest bend to the largest extension of the knees (angle 2 - angle 1 / change in time).

-Setting test numbers close to the net[7]**:**

The purpose of the test: to measure the accuracy of a setting near the net.

The tools used in the test: a volleyball court, a net at a legal height, three legal. volleyballs, a holder with a height of (2.43) m, to which a basketball ring with a diameter of (45) cm is attached, a circle with a diameter of (1) m, so that Its borders touch the center line and its center is far from the side line of the playing field according to each type of preparation skill **as follows:**

- In the high forward setting skill (stability, jumping), the basketball ring holder is placed in front of the tester so that the side line near the center of (4) is away from the center of the circle allocated to the laboratory a distance of (5.5) m.

- In the high back setting skill (stability, jumping), the basketball ring holder is placed behind the tester so that the side line near the center of (2) is away from the center of the circle allocated for the laboratory a distance of (3.5) m.

-The center of the basketball ring is 50 cm away from the net.

-Performance specifications:

The setter stands inside the circle so that it faces the basketball ring holder to perform the front setting skill and the basketball ring is behind it when performing the back setting skill and the trainer delivers the ball to the tester from the designated location as shown in figure (1) so that the tester in turn prepares the ball to the basketball ring holder.

-Conditions:

-Each player is given (3) attempts.

-The setting must be done within the circle.

-The attempt is successful if the ball enters the basketball ring.

-Registration:

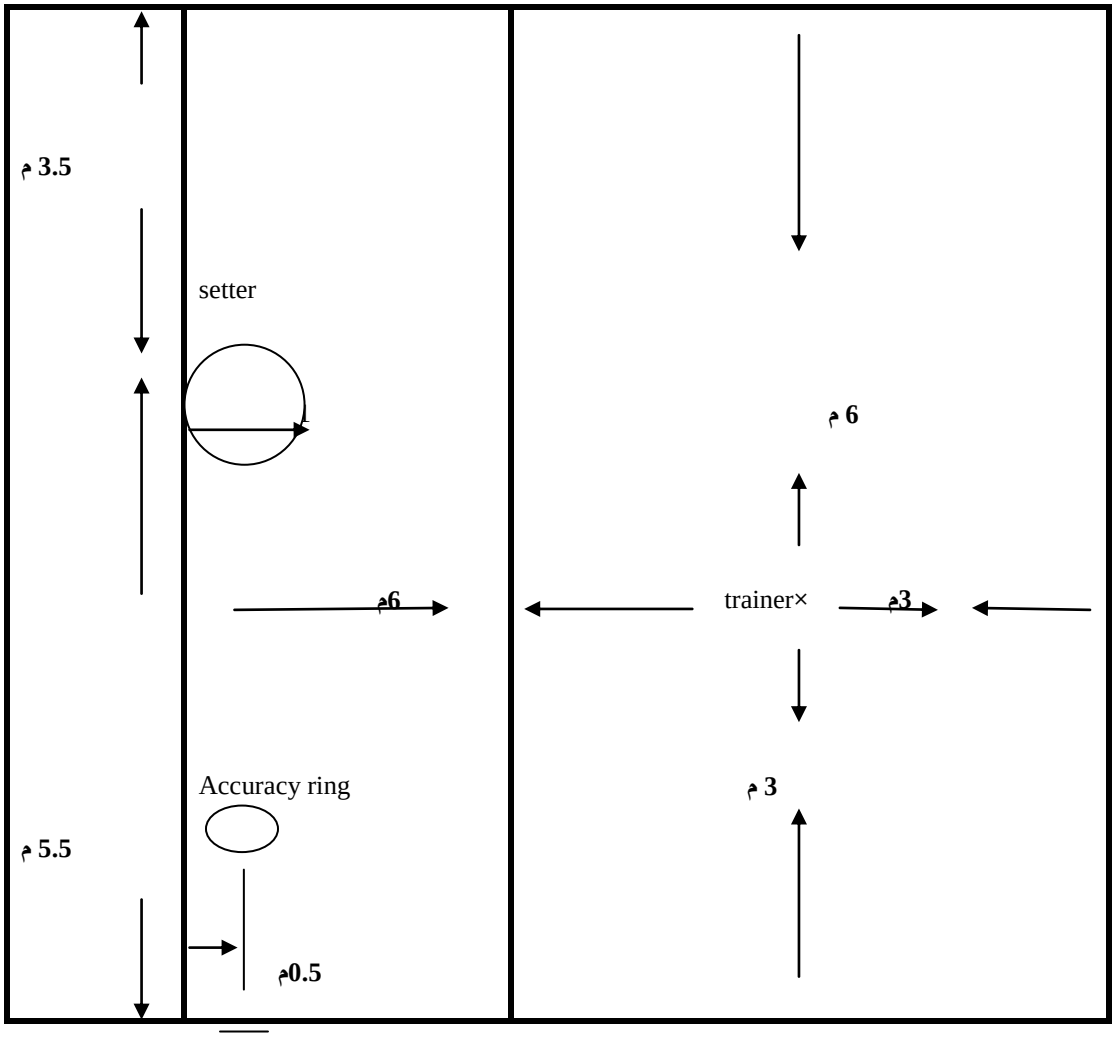
- The tester records the total points obtained in the three attempts granted to him, according to the following calculations:

- Three scores are assigned for every attempt the ball enters the ring without touching it.

- Two scores are given for each attempt that the ball enters the ring with its contact

- One score is assigned for every attempt the ball touches the ring without entering it

-A zero is given in the case of any performance contrary to the aforementioned.



Form (1)

-Basic experience:

-Pre-tests:

The pre-tests were conducted at 4 pm on Thursday, 2/13/2020 .

-Special exercises:

-Special exercises were started on Friday, 2/14/2020. The training continued with special exercises for a period of (6 weeks) included (24) training units, with (4) training units per week on days (Friday - Saturday - Monday - Wednesday). It is applied the special exercises in the main section included special skill exercises to develop mechanical variables (such as mechanical movement behavior) and the accuracy of performing the setting skill.

-Post-tests:

The post tests were conducted for the research sample at 4 pm on Friday 3/27/2020.

-Statistical means:

The researcher used the program for statisticians (SPSS), which included the following:

-The Arithmetic mean

-Median

-Standard deviation

-T-Test for the corresponding samples

–Skweness coefficient

III. Results:

Variables	Measuring unit	N	Pre- tests		Post- tests		t	df	Sig. (2-tailed)
			Mean	Std. Deviation	Mean	Std. Deviation			
the accuracy of a setting	deg	6	4.00	.89443	6.8333	.75277	17.00	5	0.000

Table(2)

The arithmetic mean, standard deviations, the calculated value (t) and the significance of the differences between the pre and post tests of the research sample for the variable accuracy of the setting skill .

Table(3)

Arithmetic means, standard deviations, calculated (t) value, and the significance of the differences between the pre and post tests of the research sample for the kinematic variables

Variables kinematic	Measuring unit	N	Pre- tests		Post- tests		t	df	Sig. (2-tailed)
			Mean	Std. Deviation	Mean	Std. Deviation			
Ball height	m	6	2.958	.039	3.046	.041	22.007	5	0.000
Shoulder angle	Deg	6	157.666	8.164	142.50	2.880	6.951	5	0.001
Knee angle	Deg	6	112.00	2.898	96.00	2.366	61.968	5	0.000
knee angular speed	Deg/s	6	297.811	4.038	428.411	38.011	9.070	5	0.000
Ball starting speed	m/s	6	6.033	.186	9.083	.231	136.400	5	0.000

IV. Discussion:

It is evident from Table (2) that there are significant differences between the pre and post tests of the research sample, in the accuracy variable of numbers and in favor of the post test.

The researchers attribute that development to the effective effect of special skill exercises and the emphasis on the principle of repetition of exercises as well as the use of training methods for developing the performance of setting skill, such as chairs, special tables, Swiss Ball and medical balls that helped improve the motor performance in terms of the joints of the body and to ensure that they are fully extended, especially the arms. This led to the development of the level of accuracy of the performance of the skill of setting as "follow-up will help with accuracy when the arms are fully extended with the hands facing the expected throwing of the pass" [8]. In addition to the progression of exercises from easy to difficult, then increased experience, all of which contributes to the development of the level of accuracy.

(Liba) [9] emphasized that training for a specific period leads to improved accuracy and that experience is directly proportional to accuracy.

It is evident from Table (3) that there are significant differences between the pre and post tests of the research sample. In the ball's height variable at the moment of touching it, there was a clear development in increasing the height for the post test, and this is important in the specification of skill performance within the mechanical conditions of performance, which came as a result of the special skill exercises that were adopted emphasizing on taking correct mechanical movement positions for performance, such as precise mechanical movement behavior, including the height of touching the ball at the moment of preparation, so the higher the better "studies on elite athletes show that maximum setting efficacy and precision is reached when the setting is carried out with an overhand action" [10]

It is also noted from Table (3) that the shoulder and knee angle variables have evolved through increasing the bending of the two angles.This was evident in the values of the two angles in the post-test, as a result of the type of exercises used in the research. Performance and to generate the appropriate force to control the ball and direct it precisely to the appropriate place for the attack, since “after the ball touches the fingers, the angle of bending of the hands from the wrist joint increases with the increase in bending of the knees” [11].

“Although an overhead pass does not require a high degree of power, it is repeated many times in games as well as training, so the pass should be as efficient as possible”[12].

Also, that bending left a clear effect on the importance of increasing the angular velocity of the knee joint, which the setter needs to jump high and achieve the high skill performance of the numbers by making use of the potential energy in the body achieved and necessary to control the ball and prepare it at a speed appropriate to the attacker and this is evident in increasing the ball’s launch speed "The angular movement or rotational acceleration of any system of connections depends on each of the internal torque produced by muscle contraction, which causes the limbs to rotate around their joints" [13]. Also, "Sports that require the speed side as a basic component of power, in order to increase the speed of the body, And the tool to its maximum, it is preferable to train on it through the specialized aspect in both strength and speed, that is, to take the same form of the actual performance of the game " [14].

V. Conclusions:

It was concluded through this research that there is a development and distinction for the sample members in carrying out the duties related to the performance of the preparation skill with the highest accuracy as a result of the effect of special skill exercises after the research sample was exposed to it.

The mechanical variables (such as mechanical movement behavior) related to the performance of the skill of preparation have improved as a result of the special skill exercises used in this study.

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