



A PROPOSED SET OF CORRECTIVE EXERCISES ACCORDING TO SOME KINEMATICS VARIABLES AND THEIR EFFECT ON THE ACCURACY OF THE PERFORMANCE OF THE FIELD DEFENSE SKILL IN VOLLEYBALL

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Abstract:

The study aims to identify the values of Certain kinematics variables to field defends skill in volleyball with players of the clubs of section II 'nobles' and the discovery of mechanical errors that have an impact on the skill performance when volleyball players' accuracy, identify the percentage contribution of some kinematics variables in result skill performance, indicate that the kinematics variables significant impact on the development of corrective exercises own skill, and finally to show the effectiveness of the exercise corrective built according kinematics variables extracted from videos analysis of performance of the players and proposed to correct skill performance of the players in clubs of section II "nobles".

In order to further study, we used the experimental method on a sample deliberate volleyball clubs activist in the second national department (regional center) volleyball, and was the 30 players, a control group of 15 Players and an experimental group of 15 club players (NAHD), (NRBH), (ASJK). Using the field observation, videography, Anthropometric measurements, field defends skill testing, kinematic analysis of videos. The researchers found that corrective exercises programmed her highly effective in developing and improving skill performance of the players of clubs in section II "nobles", kinematics analysis helps to detect and determine the kinetic errors in performance, kinematics analysis helps build corrective exercises necessary to amend the players mistakes. From all this, the researchers concluded that kinematics variables and because of its importance is an important factor that should be resorted to

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in order to develop and improve the performance of the players in the field defends skill in volleyball. Therefore, the researchers suggest the need to be a coach familiar with the principles of bio-mechanics and familiar techniques of analysis and variables kinematics skill, help of the principles of bio-mechanics and the results of the kinematic analysis to propose practical exercises and corrective exercises for skills errors.

Keywords: exercises, kinematics variables, performance accuracy, field defends skill, volleyball

1. Introduction

Biomechanics in its modern concept is a self-contained science with its own rules and applied rules. It is widely used in the mathematical field and the study of various mathematical movements. This science has an effective and fundamental role in the recorded progress of motor performance in general and sports in particular, The causes of movement and attention to study all the forces leading to it provides the most appropriate solutions kinetic motor analysis used based on mechanical variables, which includes assumptions and preliminary introductions with a modern scientific relationship to guide the athlete in various sports activities. Most scientific studies have emphasized the importance of kinetic analysis "*which depends on discovering the strengths and weaknesses and trying to find the reasons as well as finding the negative and positive variables that affect the movement in the light of the associated physical capabilities or anthropometric specifications taking into account the goal to be achieved by the movement*" . (Musallat, 1999, p. 44)

Among the games dealt with by biomechanics is the analysis of volleyball. This is because it is one of the games that have developed a lot because of the interest of the countries, as well as the link to many of the sciences that eventually led to the arrival of the game to the upper levels. Several studies and literature dealt with the subject of kinematics analysis And its relation to the dynamic performance of the skills of volleyball players and ways to improve it and this considering the attractiveness of the game and the aesthetic performance of its players and the interest of States to develop and upgrade them. Field defends skill is one of the basic skills in volleyball. All team members must be proficient in their performance and in a very efficient manner. Otherwise, the player is a source of weakness for the team, so the team coaches always seek to select the players who have a high level of skill integration. And continue to

refine this skill to the ideal level in the technique by the high definition of kinematics variables affecting the performance.

Each movement of defensive movements in volleyball has a mechanical position to play because this game is like other sports that need to analyze movements or special skills. In addition to the fact that they contain important movements through which to score as many points as possible and get the best results in matches. We cannot get good results and better and better levels without knowing the factors and biochemical variables (under study) that belong to this game, especially as this defense skill (field defends) through which to retrieve balls from the opponent and score points that qualify the team to win the game. In this study, we tried to know all aspects of kinematic analysis and accuracy of the performance of the defense of the stadium and the kinematics variables affecting it, and this by using corrective exercises based on these kinematics changes to help develop the accuracy of performance based on improved values of kinematics changes.

2. Research methodology

2.1. Research method

In order to research the subject of our study and knowledge in all its aspects, we used the experimental method.

2.2. Research population

Our research population includes volleyball clubs belonging to the second national division - center, include 12 teams of 06 states from the center of Algeria.

2.3. Research sample

We have relied on the intentional sample. The sample consisted of 03 clubs N.A.Hussein-Dey, N.R.B.Hammamet, A.S.J.Karma. Each club was divided into a control group of 05 players and an experimental group of 05 players, became the control group of 15 players and the experimental group of 15 players.

2.4. Research tools

- a) Field observation: of the performance of receiving reception and the extent to which corrective exercises are applied.
- b) Measurements: mass, length, length of arms, length of legs, trunk length, height of center of gravity.

- c) Software to extract some bio-mechanics variables: VCD Cutter 4, Adobe Première Pro CS 6, Kinovéa, Dartfish Pro 5, Paint 3.
- d) Video to perform the test: The first camera was placed vertically on the player's place of performance at a distance of (3m) on the right side of the player and at a height of (1m) from the ground level so that the beam completely covered the body of the player, The distance (3m) on the back of the player and at an altitude (1m) from the ground level, where the machines are almost horizontal level with the center of the weight of the player.
- e) Field defense skill test:
- Objective: To measure the reception capacity of the rear regions and to direct the ball to the center's precision circuits (2).
 - The player performs 5 attempts within each area (A, B)
 - The table can be placed in the center (2) and stands above the player (as a target)
 - Registration: 3 degrees of ball are received and directed to the circle (1), 2 degrees of the ball received and directed to the circle (2), 1 degree of the ball is received and directed to the circle (3), Where the highest total score is 30 points.

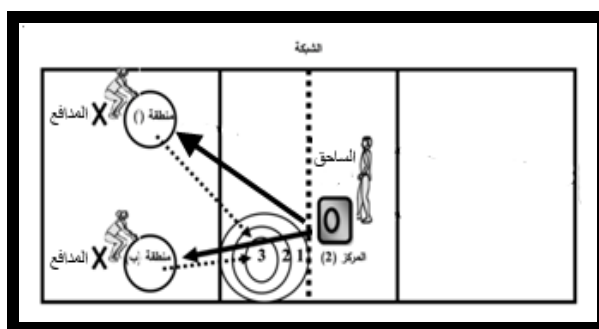


Figure 1: The form of the field defense skill test

2.5. The scientific basis of the test

To measure Stability, we used Pearson's simple correlation coefficient, and to measure the Honesty we used the root coefficient of stability.

Table 1: The value of Stability and Honesty of the skill test

Test	Value	Comment
Stability	0.752	The test has a positive and strong Stability
Honesty	0.867	The test has a positive and strong Honesty

2.6. Statistical methods

SPSS 21: Used for the Pearson coefficient, the arithmetic mean, the standard deviation, the two independent samples, the two variables, the coefficient of spacing, the coefficient of difference, the rate of evolution.

3. Presentation and analysis of the results and discussion

3.1. Presentation and analysis of the results of kinematics variables

Table 2: Shows the results of statistical indications of some kinematics variables in the field defense skill

Variable	Phase	Before contact		During contact		After contact	
		\bar{x}	S	\bar{x}	S	\bar{x}	S
Knee joint angle		108.741	06.047	107.659	09.476	109.403	09.956
Hip joint angle		92.580	07.485	90.698	08.525	91.749	07.901
Shoulder joint angle		-	-	61.830	04.612	65.325	04.752
Elbow joint angle		-	-	171.340	07.226	170.373	08.733
Ankle joint angle		-	-	87.018	08.206	88.211	05.590
Wrist joint angle		-	-	143.049	08.378	-	-
Angle of the trunk		85.386	06.132	88.706	08.681	88.189	05.916
Angle ball access to the player		-	-	53.475	07.284	-	-
Distance between feet		80.174	03.414	82.298	03.517	79.496	04.456
High center of gravity		75.711	07.420	76.733	08.592	79.435	08.737
High of ball on ground		-	-	82.984	07.622	-	-

3.1.1 Comment

We observe that the standard deviation values for the variables (angular joints of the knee, hip, shoulder, elbow, ankle, wrist, torso, ball reach, distance between feet) During the three stages of the performance of the field defense does not exceed 10 degrees and this indicates the convergence of the results of the players of the mean of each kinematics variable, and also we note that the results of the means of the different variables and slightly different from the ideal variables that must be during the performance of the skill.

3.1.2 Conclusion

We conclude that the players convergence in the variables and this guide Stability and Honesty of the two groups, and that the level of players studied by them have a weak level in kinematics variables and thus a poor level of accuracy of skill performance and this is a proof of errors.

3.2 Discuss the results of the tribal and remote tests of the two groups

Table 3: Shows the calculated and scheduled results of the test of the two groups

Group \ Test	Pre-test		Post-test		T Calculated	T Scheduled	Type of significance
	\bar{x}	S	\bar{x}	S			
Control group	12.86	1.76	12.53	1.12	0.751	2.145	non signific.
Experimental group	12.66	1.54	17.66	2.22	7.229		signific.

3.2.1 Comment

We note that the calculated value of the control group in the field defense test 0.751 is less than the scheduled value 2.145. This means that the results of the players in the test did not improve or change. The calculated value of the experimental group 7.229 is greater than the scheduled value of the test. This means that the results of the Post-test are better than the results of the pre-test.

3.2.2 Conclusion

We conclude that there are no statistically significant differences between the pre-test and Post-test of the control group, which means that the level of players is stable. And that there are differences of statistical significance between the pre-test and Post-test of the experimental group, which means that the level of players developed in the post-test compared to the pre-test due to corrective exercises to develop the accuracy of performance according to some kinematics changes.

3.3. Discussion of the results of the tribal and remote tests of the two groups

Table 4: Shows the calculated and scheduled results of the test of the two groups

Group \ Test	Control group		Experimental group		T Calculated	T Scheduled	Type of significance
	\bar{x}	S	\bar{x}	S			
Pre-test	12.86	1.76	12.66	1.54	0.330	2.048	non signific.
Post-test	12.53	1.12	17.66	2.22	7.970		signific.

3.3.1 Comment

We note that the calculated value of the pre-test for the field defense test 0.330 less than the scheduled value 2.048. This means that the results of the control group are no different than the experimental group and have not improved or changed. The calculated value of the Post-test for the field defense test 7.970 is greater than the Scheduled value, which means that the results of the experimental group players are better than the control group.

3.3.2 Conclusion

We conclude that there are no statistically significant differences between the two groups in the pre-test. This is due to consistency of the level and equivalence of the samples and their homogeneity, stability and truthfulness of the test. There are also significant differences between the two groups in the post-test, which means that the level of the players of the experimental group developed comparing to the control and this is a review of the use of exercises to experiment to develop the accuracy of the performance of the field defense according to some kinematics variables and non-use of the control.

3.4. Discussion of the relationship between the biochemical variables and the accuracy of the skill of defending the field

Table 5: Shows the results of the association of kinematics variables with the accuracy of the field defense in the Pre-test

Kinematics variables	Phases	The correlation of variables with the accuracy			Scheduled value
		Before contact	During contact	After contact	
Knee joint angle		0.492 -	0.539 -	0.526	0.361
Hip joint angle		0.679 -	0.708 -	0.659	
Shoulder joint angle		-	0.456 -	0.430	
Elbow joint angle		-	0.713	0.701	
Ankle joint angle		-	0.378 -	0.398 -	
Wrist joint angle		-	0.360	-	
Angle of the trunk		0.429 -	0.502 -	0.486	
Angle ball access to the player		-	0.456	-	
Distance between feet		0.377	0.448	0.456	
High center of gravity		0.359 -	0.464 -	0.430	
High of ball on ground		-	0.538 -	-	

3.4.1 Comment

We observe that the values of the Pearson correlation coefficient calculated between the kinematics variables during the three stages with the accuracy of the field defense skill, which reached a maximum of 0.713 for the angle of the elbow joint during contact and the lowest 0.377 for the distance between the feet before the contact is greater than the value of 0.361 Except the value of the wrist joint angle at contact 0.360 and the height of the center of the weight of the body prior to contact 0.359 which was less than the value of the scheduled and most of them were negative values and some positive values.

3.4.2 Conclusion

We conclude that there are statistically significant differences between the different kinematics variables and the accuracy of the field defense skill of the players in the control and experimental groups in the Pre-test, This means that the results of skill performance are affected by these kinematics changes in their accuracy, except for the variable angle of the wrist joint during contact and the high position of the weight of the body prior to contact is not related to the accuracy of the skill.

4. General conclusion

- Corrective exercises programmed to have a great effectiveness in developing and improving the performance of players in the field defense skill and this in terms of statistical differences between the Pre-test and Post-test of the two groups.
- Bio-mechanics analysis helps to detect and identify kinetic errors in the performance of the field defense by studying the laws and mechanical foundations and by identifying the kinematics parameters of the skill.
- Bio-mechanics analysis helps to build the corrective exercises necessary to modify the mistakes of volleyball players in skill through training to get them to know their good and correct performance by identifying the missing kinematics variables and thus identifying the motor errors within the limits of human movement.
- Controlling the principles and fundamentals of kinematics and the use of variables and mechanical laws and knowledge of the anatomical and muscular boundaries of the player's body as well as knowledge of the kinetic characteristics of the player's performance and the motor requirements of each skill and its different forms and different ways to perform it facilitates analysis of the dynamic performance of the field defense skill in volleyball using the laws and principles of bio-mechanics of skill .
- There is a statistically significant correlation between the negative values of the Pearson correlation coefficient and some kinematics variables in the performance stages of the skill and the accuracy of the performance of the players in terms of the results of the tests on the other hand evidence that the decrease in the values of these kinematics variables increases the level of accuracy of the players.
- There is a statistically significant correlation between the positive values of the Pearson correlation coefficient and some kinematics variables in the performance stages of the skill and the accuracy of the performance of the players in terms of

the results of the tests on the other hand indicates that by increasing the values of these kinematics variables the level of accuracy of the players increases.

- There are statistically significant differences between the results of the post-test compared to the pre-test in the test of skill of the experimental group and the absence of significant differences of the control group evidence of the effectiveness of corrective exercises based on kinematics changes in the development of the accuracy of the performance of the players of the experimental group.
- We conclude that kinematics variables are important factors to be used in order to improve the performance of players of the field defense in volleyball. The effect of these variables in the detection of errors and the building of corrective exercises can improve the accuracy of skill performance. The results of this study were found in the following tests, and after we found differences of statistical significance indicating the development and improvement of the level of performance of the players through the results obtained in the post-test compared to the pre-test.

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